

# AVIATION WEEK

A MCGRAW-HILL PUBLICATION

AUG. 24, 1953

50 CENTS

## The Navy looks to the future

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Her unusual lines, delta-wing and hydro-skis (a "first") all point to the fact that she was designed to give high speed land plane performance plus the mobility of a water based aircraft.

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## NEWS DIGEST

### Domestic

Beech's jet transport, the upcoming Model 587 (Aviation Week, June 28, p. 12), may be in operation by 1955, Civil Aeronautics Administrator Fred R. Lee said last week.

Aviation industry should act now to set up a single grade of fuel for commercial jet planes to help keep operating costs at a minimum, warns A. R. Optico of Esso Export Corp. He says, "Multiplicity of fuel grades has been a problem which has kept prices beyond control and has undoubtedly resulted in increased cost of distribution."

USAF pilots last week passed out of a solid test stage into a C-40's lucky landing system to build up efficient personnel to face the transport's shift, which from its well. Action avoided a right crash landing at Seoul, Korea.

Robert E. Gross, president of Lockheed Aircraft Corp., last week was appointed to a 12-man committee named by Defense Secretary Charles E. Wilson to review and moderate financial practices of the "biggest business in the world"—the Defense Department.

Mooney Model 20, new four place personal aircraft, usually completed test flight tests Aug. 10 in Knoxville, Tex. The Scotman is powered by a 161-hp Continental engine, and designed to cruise at better than 160 mph, climb more than 1,000 ft. per min., and land at 61 mph, under fully loaded conditions.

CAA investigators have turned up no conclusive evidence in determining the cause of a Wisconsin Air Lines crash that killed 58 persons July 12 off White Island. They will take technical shots to Washington, D.C., for further study.

Northrop Aircraft is developing the XR-62, Hawk prototype bomber (Aviation Week, June 23, p. 10) at Hawthorne, Calif. USAF already revealed last week. The Hawk is powered by an Allison jet engine and is being flight tested at AF's Langley research test range, Texas, Fla.

Seven C-124s have a record 1,680 passengers Aug. 15 on USAF's Korean airlift Tokyo-Seoul.

Capt. Eddie Rukundash, chairman and chief executive officer of Eastern



### Navy Getting New Blimp

Ataf's acquisition of new Goodyear ZP-4K rigid-inflatable blimp under construction for the Navy at Akron, Ohio. An estimated number of the craft, designed for two-man windows, are being built. Powered by two P&W R-1190 engines, the ZP-4K will be able to cruise at approximately 45 mph. They will have composite-skinned sections at

along having a capacity of \$17,000 on. It is of helium gas. Crew will consist of eight officers and enlisted men. A noteworthy feature of the craft will be their flexible balloon-still design. "Blimp" shape of 21 ft. in diameter. They will incorporate a composite section providing one of four feet for forward landing and reverse thrust.

At Akron, will deliver the principal ad ding at a safety losses Sept. 3 at Dayton, Ohio, in connection with the National Air Show.

May Gen. Walter G. Bain, Director of Procurement and Production for Air Materiel Command, is returning to military duty Aug. 28, four months after he was promoted to the AMC post. He will be succeeded by Maj. Gen. David H. Baker, AMC Controller.

U.S. lightplane exports in July totaled 49 aircraft valued at \$505,590, bringing the total as of this year to 317 units at \$2,101,591, Aviation Industries Corp. reports.

VHF message facility will be operated by CAA at New York's Idlewild International Airport under a one-year license provided by the Post of New York Authority. Installation will be located 450 ft. southwest of Runway 1-19.

### Financial

United Aircraft Corp., East Hartford, Conn., reports net income for the first half of this year totaled \$12,570,314, an increase of \$6,729,991 over the same period of 1952. Total shipments were \$168,574,280, compared with \$153.

\$81,595 last year. Basking and letters of interest \$1.5 billion.

Kellett Aircraft Corp., Camden, N. J., reports net profit of \$119,493 during the first six months of 1953, compared with \$80,946 the first half of last year. Sales increased approximately \$760,000 over 1952.

Rean Aeronautical Co., San Diego, has declared a regular quarterly dividend of 10 cents per share of common capital stock payable Sept. 11 to stockholders of Aug. 31.

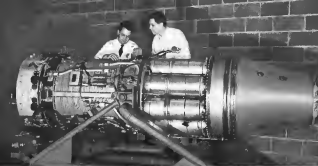
### International

British aircraft exports totaled a record \$185 million last June, \$42 million more than the previous high of \$174 million in May.

Israeli Airlines has received permission from Australian powers in Australia to operate a Tel Aviv-Victoria route. It is expected to begin the new route this winter.

Philippine Air Force has set up a research and development board to study production of gliders and aircraft spare parts from materials available on the island. The board also will investigate the use of alcohol as aircraft fuel.





## G-E Development Program Will Save USAF \$100,000,000 On B-47 Powerplants

### Engine Improvements Double Service Life Between Overhauls of J47-25

During some of its best engineering efforts at making a good engine even better, General Electric has succeeded in doubling the life expectancy between overhauls of the J47-13 engine, powerplant of the famous Boeing B-47 bomber.

This extended life is the direct result of a continuing program at General Electric to improve the performance of production engines while engines await powerful, lighter weight, more efficient engines for the future. Does it pay off? G-E engine improvements, coupled with the Air Force's quality control and field maintenance programs, will save U.S. taxpayers \$100,000,000 a year on the 25 engine alone!

Actually General Electric's engine improvement and development program has resulted in over 3000 improvements in the J47 engine—ranging in scope from a minor change in fasteners to a major change in combustion chambers.

That engine improvements alone are not enough at G-E. First and largest manufacturer of jet engines in the U.S., General Electric is also continuously improving manufacturing processes. Vertical assembly is a good

example; it saves space, speeds assembly, insures optimum alignment of engine parts.

Such improvements are the basis for the statement, "Progress is our most important product." Section 238-16, General Electric Company, Schenectady 5, N.Y.



POWERFUL J47-13 G-E J47-13 engines, the Boeing B-47 bomber can now fly twice as long before engine overhaul... a direct result of G-E's engine improvement and development program and the USAF's quality control and field maintenance programs.

Aircraft Gas Turbines

**GENERAL ELECTRIC**

## WHO'S WHERE

### In the Front Office

A. V. Lefeb, former vice president from 1951 to 1953, will return to the front office in 1954 as vice president finance and insurance. Eds. Corbin has resigned as TVA treasurer, effective the same date to join Glaxo E. Martin Co., Baltimore.

Condon S. Light is now staff engineer to the president of Engineering & Research Corp., Riverside, Md.

### Changes

Edna M. Russell has become manager of Confidential Aviation & Engineering Corp.'s Technical Div., Detroit.

Joseph M. Minton has been appointed chief propeller engineer in charge of Curtis Wright Corp.'s new propeller manufacturing service at the Propeller Div., Lakeland, N.J.

Other changes: Len E. Winters, chief propeller design engineer; Donald R. Wood, chief development engineer; John L. Hill, propeller engineer in charge of the turbo-propeller section; Foster E. Swales, chief technical engineer; Allen V. Bond, staff engineering specialist; William F. Meyer, staff engineering specialist; Jack H. Kuhn, chief production design engineer; William F. Baker, chief blade design engineer; and John F. Bane, project engineer-in-charge.

George Reed is now chief aircraft engineer for Aero Inc., Los Angeles.

Nicholas M. Steffen has joined Aerospace Industries Co., Meridian, Idaho, Calif., as chief engineer.

William M. Steffen has been appointed general supervisor of materials and process engineering for Nucleonics Aircraft, Hawthorne, Calif.

J. W. S. Saunders is now traffic director of the International Air Transport Assn.

Chas. McKelvey has become director of research for Air Products, Allentown, Pa.

T. W. Connors has been appointed operations manager of National Aircraft, Allentown, Pa.

Also promoted: Russell G. Coffin, staff manager; M. A. Kennedy, personnel manager; George E. Muller, public relations manager; R. W. Chambers, inspection manager; and G. G. Schell, budget manager.

G. Wilcox Lefeb has joined Nucleonics Corp., New York, as project engineering.

Luke L. Hillard has been named communications director for Aerospace Industries Co., Meridian, Idaho, Calif.

Harold E. Hader has been named vice manager of Panavia Corp.'s Aircraft Div., Toronto, Ont., Mich.

### Honors and Elections

O. E. Morrow, president of Motor Air Transport, has been elected last vice president and director of American Transport Assn., according to Philip Mann of American Air Transport, who received recently. Also, J. B. Johnson is AITA's new executive director, and A. L. Rowe has been elected to general manager.

## INDUSTRY OBSERVER

► First flights of a Korean wing-joint fighter have been reported by observers behind the Iron Curtain. The plane is reminiscent of the British Saunders-Roe designs of a few years back. Machines wing-joint and a body. Trial air reconnaissance features. Half is double-winged, an interior is behind and below high forward cockpit position. First flight was in June at Nagasaki, center of Red steel aviation.

► Red night-fighter group equipped with MIG-17s has been saved from Minsk (Moscow Times May 4 p. 11). The MIG model MIGs had two and four turbojets similar to those on the IL-78. The fuselage was about 4 ft. longer than the MIG-15; a double overboard wing root, and the landing gear was very short. Four cannons, probably about 23mm, were the armament.

► Although both Westinghouse and the Navy are phasing their needs close to the heart, there are indications that the Rolls-Royce RB.44 Avon which recently passed its type test at 9,500 lb thrust will be built by the U.S. as part of the recently announced Rolls-Westinghouse technical agreement. Navy built a high-powered jet engine for its own production of fighters and attack planes.

► Arnold Engineering Development Center at Tullahoma, Tenn., is scheduled to begin calibration runs on the test cells in its engine test facility next month.

► One CAA theory being investigated on the parent has which led to the crash of the experimental AG-1 agricultural plane in that area of the propellers in the fuel tank was being clogged fuel flow or affected the propellers. A magnetic test disclosed the presence of such problems in the sheet near the engine.

► Problems of helicopter blade design is complicated by the fact that mechanical stresses such as being "bored" cannot be used. Thus after the blade section has been tested, it is tested in a wind tunnel and predicted but not enough for the blades with air temperatures of about 100 deg. the ATA helicopter committee learned in its recent survey of Sikorski and Piasecki plants.

► New Air Force proposals regarding the four-engine Boeing B-52 involve substitution of the Pratt & Whitney JT87 for the Allison J74 engines scheduled for the bomber. Air Force and Boeing are both reportedly pleased with the performance of the JT87 as the biggest Boeing B-52, and on advantages to using the more powerful engines in both places.

► United's proposed Martin to develop executive transport (Aviation Week June 1, p. 18), and a group design, would cruise at about 180 mph with a range of approximately 1,400 mi. according to preliminary design figures. Overhaul of the engine is to make it a one-stop over-haul engine. Design includes proposed cabin for operation at 10,000 ft with 6,000 ft. deck level, including 4,000 ft. for fuel.

► Proposal for a test facility being examined by Air Transport Assn. helicopter maintenance provides for five helicopter landing gates and a technique under which the engine will "run in the air," land in one minute. Under such a technique, it is expected the engine can complete the cycle of loading, unloading, landing, engine check and takeoff in 12 minutes. Then the five gates could handle 25 arrivals and departures an hour.

► Atomic Energy Commission reports that infinite requirements for an atomic reactor have been made and the program has been started. However, construction contracts totaling \$5.5 million have been let for test facilities in Idaho and at Oak Ridge. Laboratory for the aircraft nuclear development program, and development work continues at General Electric's Erieville, Ohio, plant and at Oak Ridge. Meanwhile, another contract was signed in June for aircraft propulsion development at Pratt & Whitney Division of United Aircraft Corp.

## Washington Roundup

### Big Decisions Soon

New major decisions that will set the defense course of the defense program will be out soon. This is the outlook now.

• **The Joint Chiefs of Staff** will complete their review of strategy and force levels approximately the third week of September. They are not starting from scratch, but accepting most of the basic decisions of the 1948 Key West conference. For example, the requirement of strategic air as the primary mission of the Air Force—and updating them.

Decisions in the guided missile field, however, might have a major effect on the role and mission of the service—and are sure to be hotly argued. Some conflicts will be decided by the Joint Chiefs of Staff, while others, more controversial, as in the guided missile field, probably will go to National Security Council for final decision.

• **The National Security Council** will take up the air strategy plan and set a tentative ceiling for the fiscal 1955 defense budget some time before the end of September.

• **By the beginning of October**, Defense Department's comptroller, Assistant Secretary W. J. McNell, expects to start moving on the coming year budget. The services already have done preliminary work.

• **If the schedule is kept**, the fiscal 1955 budget, geared to the new JCS plan, should reach Congress on time next January.

### Army vs. Air Force

The conflict between USAF and Army over guided missile production may lead into open warfare—the latest news from USAF's USAF-Airight says strategy is, but the top defense command is rejecting USAF's Chief of Staff, Gen. Nathan Twining, and Army's Chief of Staff, Gen. Matthew Ridgway to play with the "bombs" and use it to their mutual advantage.

Army's guided missile program is not only cutting into USAF's air defense role, but also of an entire surface missile would cut into Air Force budget and considerable mission. Navy, so far, is on the run of the lighting.

### Procurement Money Prospects

Defense Comptroller McNell makes three points.

• **If the JCS enforces a 143-year USAF**, it is a "gut-buster" whether aircraft procurement funds in fiscal 1955 will be much above the fiscal 1954 level of \$1.9 billion, but there would be a substantial increase in fiscal 1955.

• **It will be neither year or two before there is any great increase in funds for guided missiles.** Since the Korean outbreak in mid-1950, \$4.8 billion has been made available for guided missile programs—research, facilities, and some production. Of this amount, \$3.7 billion is committed and \$200 million now shown on hand for obligation.

• **Army, meanwhile, says it will go ahead with a \$146 million aircraft procurement program this year.** Army's procurement money may hit \$178 million by Congress, but it isn't planned to apply any of the cut in the air craft program.

### New Key Men

• **Frank D. Newbury**, Assistant Secretary of Defense for Acquisition Engineering, is expected to replace as the new key man in the guided missile program. R. S. Miller, director of guided missiles, is expected to be placed out. Newbury will make recommendations on what missiles are to go into production—and when. And as an engineer, he was vice president and head of the Western Electric Corp. before rejoining the DOD.

• **Charles Sparks Thomas**, Assistant Secretary for Logistics and Supply, will coordinate the USAF and Navy defense procurement budgets for the coming fiscal year, before they go to the comptroller's office for review. In the past, elements by the Air Force and Navy, with all three services represented, has been no more than routine meeting.

• **Donald Gaudin**, Assistant Secretary for Research and Development, similarly will join on the studies research and development budgets instead of the new defense Research and Development Board.

### Obsolete: When?

Under heavy congressional pressure, Defense Secretary Wilson is expected to come up with a new schedule for determining aircraft obsolescence—at the behest of Senator Robert J. Foy, the strongest but not alone.

An Air Force now sets standard periods—three years for fighters, five for bombers, seven for transports. Navy, however, goes elsewhere to the state of military progress. Phasing out of planes under the Navy system requires more time. However, it is much more popular politically because it results in greater savings of government money.

### R & D Outlook

Here are future trends in Air Force's research and development programs.

• **Air Force assistant** Tavis Carver has made little headway in selling top defense officials on simply stepping up research and development as government drives out.

• **Deputy Secretary Roger Kent** is showing more receptiveness toward research. When Congress transferred \$75 million of the \$475 million requested for R & D, Kent approved the drop to 25% of the total request but office withheld pending a review of the program. Now the withheld amount has been increased and USAF has been given the green light to program the full \$440 million appropriated by Congress.

• **Selectivity will be the keyword in the future.** There will be more emphasis placed on fewer projects, rather than spreading the emphasis over broad number of alternative projects.

• **Extensive aviation and SAC projects** will take the lion's share of the cut. Air Force has top priority in the program.

• **There is little likelihood** the atomic aircraft program will be revived. Air Force's top civilian and military command has recommended the cancellation to the Secretary of Defense, and there were few doubts in USAF down the line.

—Katherine Johnson

# AVIATION WEEK

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## ATA Committee Forecasts:

# Big Copters May Replace DC-3s by '59

- **New airline trend is toward acceptance of rotary-wing aircraft as the short-haul, inter-city transport.**
- **And the commercial air bus development is keyed to the S-56 and XH-16 as possible prototypes.**

By Alexander MacFarley

Only a year ago was the prospect of fleets of 30 to 50-passenger helicopters being competing directly with airlines based on short-haul inter-city public transportation.

That is the outlook projected last week by the Air Transport Association's helicopter committee in a special report, which lists together today's known capabilities with tomorrow's possibilities.

• **Two Prototypes—Key to the forecast** is the fact that two large two-engine copters, possible prototypes for such commercial use, are now in testing completion at Pando Helicopter Corp. and Sikorsky Div. of United Aircraft Corp.

The ATA committee expects commercial helicopter transport, developed from these as similar utility prototypes, to build up operational experience and establish a sound foundation for future proposed designs.

The copters will fly local scheduled operations, leading to tentative studies for transfer to long-range aircraft. This stage is predicted within 15 years.

Much significance of the ATA report lies in the fact that it represents the thinking of most of the principal U.S. air carriers with local service potentials, airlines that have been actively fixed-wing aircraft operators in the past except for a Western Air Lines' local experimental helicopter service.

• **New Philosophy—Active acceptance** of the rotary-wing direct link is seen as a piece of the fixed-wing transport for local service operations still is preliminary.

But the new trend is toward writing a death warrant for fixed-wing before transport. This probably is at least a partial explanation for the lack of enthusiasm that most fixed-wing aircraft manufacturers have shown toward post-war development of a further transport to replace the now obsolete DC-3.

"The helicopter has two main advantages. It operates from smaller terminal areas than fixed-wing aircraft and so fly at very low speeds," the report

says. "These will permit us transport time to exceed road fields where the airplane cannot now compete."

• **Costs No Greater—The committee** says the helicopter has no big advantage over fixed-wing aircraft within the next decade at an overall cost no greater than present day two-engine aircraft and at rates adjusted to include possible future production costs, as the average passenger-mile fare will be no higher than fixed-wing air fare of today.

• **Sikorsky Design—A commercial** transport helicopter to be developed from the S-56, now nearing completion as a Marine and Army assault transport, is produced by Sikorsky, the ATA report forecasts.

"This is a single five-blade rotor helicopter powered with two turbine engines. Powerplants are mounted in nacelles at the outboard end of each wing located above the fuselage. Landing gear is retractable. Rotor system and blades are fully electric. A single tail

rotor and horizontal stabilizer provide directional control and longitudinal stability. Payload capacity is 16,000 lb. for 2200 sq. ft. rotor disc, with a cruise speed 50 passengers, gross weight is expected to be about 14,000 lb., the report says.

"Performance is estimated as follows: Cruising speed, approximately 140 mph, vertical lift capacity out of ditch on level, approximately 2,000 ft. per min., minimum flight speed with one engine inoperative, 25 mph."

In the absence of a definite sign at this stage, the committee estimates that the \$100,000 price of the present S-55 first production cost of the new version will be \$150,000 to \$200,000.

The report also forecasts a connection to the single-rotor philosophy using a larger number of blades—more, greater than five if necessary. It is the committee's view that the single-rotor system is 15% lighter than the dual or tandem-rotor and has no complications.

• **Power Required—Power** requirements for maximum safety are set at approximately 100 hp of lift-off power per passenger, about the same as the fixed-wing aircraft.

By partially understanding rotor blades with high speeds, helicopter speed will be increased. Cruising speed of 200

## ATA Committee Compares Copter vs. Fixed-Wing Transport

	Airplane	Helicopter	Feasible
Maximum speed	75 mph	0 mph	0 mph
Minimum speed	600 mph	120 mph	180 mph
Takeoff and landing area, length	3,000 ft.	150 ft.	100-400 ft.
Max climb gradient, all engines	Approx. 5 deg	60 deg	70 deg
Max climb gradient, one engine inoperative	3.45 deg	—11.1 deg	7.7 deg
Stability	Good	Not yet sufficient	Unstable
Maintainability	Good	Exceptionally good	Exceptionally good
Instrument flight capability	Good	Un satisfactory	Satisfactory
Approach speeds	Good 20 mph	20 mph	40 mph
	Still used	Still used	Still used
	plus 10 mph		

phs should be attained eventually.

- **Turbine Advantages**—Three reasons for advantages of the turbine-powered helicopter are cited as:
  - **Lighter weight**
  - **Less vibration**
  - **Constant rpm** for consistent rotor efficiency
- **New Helicopter Development**—Pittsboro's continued transport development will be an offspring of the second Pave III XH-16.

The commercial engine will be designed to be powered by two turbine engines, Allison T-43s, at 7.5% in the cruise envelope. The report says the first XH-16, powered by two Pratt & Whitney R2700 engines, "appears to be unworkable for its role."

It is expected that the first XH-16 will carry 30 to 40 passengers, but the turbine-powered configuration is expected to carry 50 as a high-density version.

The committee reports the following item specifications for the commercial Pave III Gross weight, 45,000 lb. in payload, 35,000 lb. with 200 passengers in cargo and 40 seats, cruise, cruising speed, 310 knots.

• **1999 Delivery**—The second XH-16 prototype with turbine will be being within 12 months. With two cores "for testing, taking and getting production rolling," the committee expects available surface fleet delivery date will be sometime in 1999—pending passage of initial military orders.

The report points out that all Pave helicopters to date are used only in military operations and that, until flight time of Pave III helicopters as far as approximately 18,000 h, with a maximum of about 1,400 h as an individual Pave III machine.

Availability of powerplants is being the main governing factor in personnel. Admittance of the turbine depends on the rate of progress of development of these powerplants in availability.

In the interim, the report suggests Pratt & Whitney's standard turbine engine, the XT700, as "the best light for 30 to 40 passenger helicopter." It indicates that 50 passenger helicopter variants will meet the turbine powerplants.

• **Capable Standards**—There are proposed requirements for transport helicopters as seen by the committee:

- **Size** if any helicopter used by the scheduled airlines to replace currently used twin-engine equipment for local subscale operation and extension of service to other traffic cities, say, not less than 30 to 40 passengers—and perhaps not more than 60 to 90—should not be considered.

Thus, the design provided will not be less than 6,000 sq. ft. more than 30,000 lb., size of the average intermediate bus

- **Range** It must have maximum range of 250 to 300 mi. with maximum payload and one-half hour fuel reserve. Fuel reserve should be fuel weight, not capacity, to apply because of the low loading capacity of the helicopter.
- **Speed**—Cruising speed should be as high as possible, because direct flight can save directly proportionate in cruising speed. Maximum is considered to be 300 mph at maximum cruising power. This is feasible today and can be corrected easily.
- **Flight safety**—In view of the greater frequency of takeoff and landing when compared to fixed-wing aircraft, the helicopter must be able to operate safely with one engine responsive at maximum gross weight.

Showing that one engine should be possible immediately after takeoff during the critical worst descent. Capable also should be able to descend with one engine responsive without damaging the aircraft.

- **Performance**—The helicopter should be as all weather helicopter. Able to handle a type of service equal to or better than that now supplied by two-engine, fixed-wing aircraft.
- **Cockpit**—Visibility, control arrangement, instrument design and layout should be the subject of a specific study.

## Air Force Cuts AMC Facilities

Economy move kills all air procurement districts and three regional offices, consolidates Olmsted AFB.

Air Force, in a new economy move, last week began cutting back its regional offices, the Air National Guard.

All six air procurement districts are being eliminated, along with three AMC regional offices. The Air Materiel Administration and Olmsted AFB headquarters at Middletown, Pa., are being consolidated.

An Air Force Undersecretary James H. Douglas gave the reasons for the shift: "To reduce administrative overhead, bring procurement and production administration closer to supply and maintenance functions and provide more efficient operations under current program."

- **Design Methods Unchanged**—Douglas emphasized that the new measures will not affect USAF's buying methods or methods for buying. It merely reorganizes the procurement system by absorbing the former procurement districts into the eight Air Materiel Areas of AMC.
- **Design Methods Unchanged**—Douglas emphasized that the new measures will not affect USAF's buying methods or methods for buying. It merely reorganizes the procurement system by absorbing the former procurement districts into the eight Air Materiel Areas of AMC.

Air Force downsized its buying methods last year (Aerospace Week 84, p. 12). The new Air Materiel Administration (AMA) is the new program. Air Force, AFM, New York, Northeastern AFB, Boston, Central AFB, Dayton, Mid-Continent

by a competent group that includes experienced helicopter pilots.

- **Costs assignment**—Helicopter insurance should be designed for light weight, maximum maintenance and high seating capacity.
- **Noise level**—The noise level, external and internal, should not exceed a maximum of 75 decibels at 100 ft. power and maximum gross weight.
- **Operating costs**—Direct flight cost per mile should not exceed that of present two-engine aircraft for a distance of 300 mi. between stops. This means that in distance between stops, decrease, helicopter cost per mile should be proportionately lower than those of fixed-wing aircraft.
- **Maintenance**—Transport helicopter should be drastically dependent from any external power source.

The report states that the committee is continuing study of:

- **Multi-engine helicopter performance** related to engine size, configuration.
- **Instrument flight rules**
- **Evaluation of specific direct flight costs and indirect operating costs**
- **Development of communication, navigation and landing aids for helicopters**
- **Casual handling**
- **Passenger and baggage handling**

AFM, Chicago, Southern AFB, Fort Worth, Tex., and Western AFB, Los Angeles.

Functions of these districts, which administer more than 14,000 Air Force contracts totaling \$16.5 billion, will be transferred to the eight Air Materiel Areas. Air regional offices will report to AMAs rather than to district offices.

The eight Air Materiel Area headquarters are: Middletown, Pa.; Olmsted AFB, Pa.; Middle AFB, Houston, AFB, Ala.; Warner Robins AFB, Ga.; Robins AFB, Ga.; Oklahoma City AFB, Tulsa, Okla.; San Antonio AFB, San Antonio, Tex.; Omaha AFB, Omaha, Neb.; and Santa Ana AFB, Calif. and San Bernardino AFB, Norwalk, Calif.

Another AMC unit will be elimination of three of the present 24 air regional offices. Cut are those at Cincinnati, Calif.; South Bend, Ind.; and Minneapolis, Minn. reported by Det 1. The remaining 21 regional offices are to be re-designated procurement districts.

• **New Midway**—Pave III is the second Pave III and the material used to which they are used.

Cleveland, Detroit, Dayton, Ottawa and Indianapolis are assigned to the Middle AMAs. Seattle and San Francisco

are assigned to Western Robins, Boston, Newark, New York, Philadelphia and Richmond, N. Y., to Middle AFB, Chicago, Minneapolis, St. Louis and Wichita to Oklahoma City, Tulsa, Ala., Los Angeles and San Diego to San Bernardino, and Dallas to San Antonio.

• **Substantial Savings**—Gen E. W. Rowles, AMC commander, stated: "We are proud of the fact that we have done this on our own. We have not been prodded into it by the Department of the Air Force. But I am glad to state that the office of the Secretary, Mr. (Frank E.) Taylor and the Chief of Staff, Gen. Nathan F. Twining, have given it their enthusiastic approval."

"We have been making thorough studies of our operations and expenditures to comply with new Air Force purposes. Consequently, we can come up with this plan which not only will result in substantial savings of taxpayer dollars but actually will increase our efficiency."

Rowles said it is not possible at present to place an accurate dollar amount estimate on the savings.

- **Contract Administration**—The 36 Air Force plant representatives, who meet in a consortium of more than 511 billion worth of Air Force contracts with large manufacturers, beginning in October will be responsible to the AMAs, thereby holding responsibility for management, work and price competition for the contractor's specific types of aircraft.

With the new plan, all of those contracts will be administered by the Oklahoma City AMAs and USAF representatives at all these plants will report to the Oklahoma City AMAs commander.

AMC's integration is expected to be accomplished by Dec. 31.

## Boech Names Three To Engineering Posts

Boech Aircraft Corp. has appointed three long-time employees to head up the company's expanded engineering division, following the acquisition of chief engineer Ted A. Webb.

- **Military projects**, A. S. Chiswell
- **Commercial projects**, Herb Rowles
- **Administrative and technical**, Don Beahm

Boech's engineering section is reported to have been set up in 1979 to support aircraft certification of the T-16 project.

C. C. Parnas, vice president manufacturing, has been elevated to the Boech head of division. Two new vice presidents have been named: newly named Boech CEO, J. W. Webb, who, incidentally, chaired out of the safety "safety zone" of the airplane after it crashed recently. His role safety was a



AG-1 CRASHED in this inverted position, but because of plane's crash-worthy features, pilot walked away unscathed. Arrow points to AG-1's left wing.



SHOULDER HARNES kept pilot from being thrown about during crash.

OVER-TURN RAILS (arrow) held up under the aircraft's impact.

## Aviation Safety

### AG-1 Crashes, Pilot Walks Away

A certificate, involved airplane crash recently solved Civil Aviation Administration's experienced AG-1 agricultural plane to a case of work.

But the accident near Lubbock, Tex., has provided the aviation industry with its most convincing demonstration of the effectiveness of engineering crash protection into the design of airplanes.

• **Walking Forward-Living**—proof of the protective design theory is walking around Washington, D. C., on temporary assignment at CAA headquarters.

Life a John Paul Jones, Jr., safety agent, says CAA's P. W. Webb, Regional

not think, based from pressing him on the control stick.

"I am completely convinced," Jones said in an report, "that the specially designed cockpit and other safety features of this plane were responsible for the fact that I lived through the crash. It appears highly probable that any other plane used for agricultural work could have been crashed in this way without killing the pilot. And it appears beyond reason that such planes could have authorized this crash and left the pilot unharmed."

• **Design Credit**—Two more drive the credit for the way industry has fared in the AG-1 crash this rigorous test.

They are Fred E. Webb, aerospace



tica engineering professor at Texas A&M College who designed and supervised the building of the AG-1, and Ray G. Collins, director of Cornell University's Civil Navy Research unit who consulted with Wick on protective features of the plane.

•**Space to Design**—Spurring their work was a long record of fatalities in crop control plane crashes. Aerial spraying, dicing and seeding are low flying operations.

In 1952, there were 49 fatal crashes in 376 crop control plane accidents. In 1953, CAA reported 13 fatal crashes out of 148 accidents during an estimated 730,000 hr of crop control flying.

•**Ransom Payment**—Keynote of Cath. Agency Research program was the message: If you can't prevent crashes, build the airplanes strong enough so occupants can walk away from accidents.

Here is how Wick and DeHaven agreed that "pilot is the AG-1."

- Cockpit structure** is designed to provide a 40G "blast of safety" for the pilot and to remain intact in impacts up to 75 mph, normal cruising speed for the AG-1.

•**Canopies** must have the cockpit to higher than the pilot's head and include strong tubular guard rails from the structure in the front of the open cockpit.

•**Cockpit** is located as far aft as possible (15 ft. from nose), high in the craft and over the rear portion of the wing, so that canopy-shielding structure is ahead of and below the pilot.

•**Forward structure** design calls for full use of progressive G loads to absorb crash energy, engine mount at 15Gs and baggage handling area at 25Gs, plus the cockpit protection.

•**Pilot seat** is designed for 40G stress and is fitted with ejection safety belt and integral two-stage rocket launchers with spring-loaded ejection seat.

The seat permits a pilot to remain fully in the cockpit under normal conditions but both automatically under loads of 4G or greater.

•**Powertech Crash**—The crash took place about 500 yds from June 16, shortly after [news had taken the plane off from a 1,600-hr, unreported landing trial at Texas Techological College near Lubbock. He was demonstrating plane to National Cotton Congress.

At the time, Jones had flown 200 hr. as the AG-1 out of a total of 434 hr. on the airplane in his two-and-a-half-year life span. He has a computer score and 6,000 hr. flying time with wide experience as an instructor and in checkouts of many different types of aircraft.

Jones said he noticed a drop in power as he began making a climbing turn at about 60 ft. altitude. He noted the

## Speed Flight Cost

Inspiring Cockburn's recent record speed flight at Edwards AFB, Calif., will cost Concord, Ltd., \$5,769.70.

An F-4 Phantom II was the Canadian firm, of which Mike Cockburn is an advisor, 32,533.45 for setting up the stage, engineering assistance, data collection, instrumentation and language studies. She set the record in a Canadian-built Concord powered F-4E, Silver jet.

During her runway period in the 7-31 and subsequent flights in the 7-40E, 10,282 gal of fuel were consumed, which will be billed to Concord at \$5,248.25.

plane down, pumped throttle and picked up additional power, thinking it would be able to clear the pole at a powerful nearby. Then the engine lost power again and, during that a crash was inevitable, Jones closed the throttle after averting to the right to the fuselage would clear the pole.

•**Canopies**—The left wing and wing steel gear were torn off by the pole. The plane traveled approximately 15 ft. and the right wing hit a main fuselage part made of a metal bar. The three

the nose to the ground and the plane curved, landing inverted and sliding several feet upside down before coming to a stop.

•**Power Loss**—Jones and CAA still are somewhat mystified by the power loss of the Continental T-325 engine. Jones said he did not hear the engine sputter or backfire but said it seemed to quit producing power at the top of the climbing turn.

On July 27 at Ft. Worth, CAA mounted the bottom fuselage on the back of a truck and repaired the McCauley J48-230 two-stage, four-blade aluminum propeller, which was bent into a partial shape by the crash. Then they made a test run of the engine.

Test engineers said they straightened a bent fuselage control and cleared carburetor air intake around but made no other changes to existing conditions, except to spin the propeller to start it because the battery was out of the plane. The engine ran for 30 min and appeared normal at all speeds.

•**Detached Plane**—CAA will test the wreckage of the bottom AG-1 to the highest bidder. It is doubtful if another plane exactly like it will be built. But CAA has made detailed sets of plans available to 14 individuals and firms in this country, and its safety lessons probably will turn up in other places of the future.



RUSSIAN JET FIGHTER

The detailed model of what is believed to be the Russian Lavochka LA-17 was built by the Navy's Special Devices Center, U. S. N. It was used as a control plane at the plane trials near Keesee during the recent war. Because of its close similarity to the Russian-built MIG-15, the LA-17 was

also mistaken for the other, more famous enemy fighter. Most important recognition feature distinguishing the two planes, the LA-17, was a third shoulder high, the MIG-15 is a low winging prop. Note the dual wing fences on this model and the high aspect ratio swept wings.



LOCKHEED RC-121C RADAR PICKET, with wide belly radars plus one day fuselage, parents old report from this angle.

## AF Orders Super Connie Radar Pickets

By William Gophers

**Budach, Calif.**—First official dispatches that USAF plans to supplement its continental defense with "long range stations" comes this week with Lockheed Aircraft Corp.'s announcement of an Air Force position contract for high-altitude RC-121C radar pickets, a military version of the Super Constellation transport.

Other manufacturers are known to be at work on similar types, indicating importance Air Force is attaching to reform radar in its defense planning. Lockheed is first to announce a production contract, however.

•**Shack's Fin**—Air Force—Most details of the RC-121C system under security wraps, but it is similar to the Navy's WV-2 version announced some time ago. WV-2 is successor to the WV-1, built Navy by last year in developing radar search for the past three years.

RC-121C will carry height-finding and search radar in helping radars that give it an unusual configuration.

•**Altitude**—The aircraft will fly from the top of the fuselage like a shark's fin because the height-finding radar antennas are a good horizontal column, hanging from the bottom of the aircraft like a large humpback, instead of the antenna search radar antennas. Air Force has decided to exact one but Lockheed describes it as "probably the largest plane, part over birds" Zenith Pacific Co., Los Angeles, manufactures the radars.

Steady radar antennas down the spine of the fuselage add a new look to the top of the radar plane. •**Greater Range**—The RC-121C is expected with more than ten times of complex coverage and accuracy. Radar

coupled on both sides of the center main are fixed by several chains in front of large radar spools. Rotating area of which is the main chain of the transport system is almost solid with electronic equipment.

The RC-121C will have greater range and endurance than the commercial Super Constellation, with typical 30 hr. at added capacity for more than 20 hrs. of working on station.

Engines are the same four Wright 3,250-hp. Turbo Compounds.

•**Flying Power**—GSAF desires to purchase the radar picket plane as a replacement by seven years left as U. S. radar fleet by mid-1960 of ground-based stations to overcome height-finding radars because that allowed enemy planes to sneak in at low altitude.

Use of the RC-121C, designed to carry powerful search radar in high altitude, will only add to the threat of detecting low-flying enemy aircraft but also extend the range of U. S. defense facilities beyond the present capabilities of ground-based radar.

With sufficient quantities of picket planes eventually replacing each other on station, a constant patrol of U. S.-based radar planes would be possible and beyond U. S. borders.

•**Interceptor**—GSAF—The RC-121C also may be used as an airborne control center to guide interceptors in approaching enemy aircraft long before the "bigger" are within range of ground stations.

The great radar plane, with their vast array of electronic equipment, can direct jet interceptors to pursue altitudes and locations in relation to approaching enemy aircraft, thus permitting a sophisticated radar system in the interceptor itself.

With three or more radar controllers

working for every aircraft, each can concentrate on a different portion of the scope picture. Another controller may be assigned to simultaneous weather reconnaissance for guidance of the interceptors.

Large TV relay units can be used to transmit radarscope pictures from the picket plane to ground control stations. These TV transmitters also can relay a picture from a more distant plane to the ground station.

•**Flexible Look**—The radar plane then becomes an integral part of an air weapons system, which includes interceptors, a network of ground antennas and the early warning system. The system can be linked to guided missile bases for further protection.

The picket plane will be equipped for electronic countermeasures and also will be able to track weather disturbances by radar.

•**Many Search**—The radar plane is a four-engine turboprop aircraft. It is expected that the RC-121C could be assigned to watch the area, then quickly returning a hole in the country's bounded radar defenses.

Under certain conditions, an RC-121C could agree to direct U. S. interceptors to enemy land targets, even through weather or darkness. The flying radar stations can spot surface as well as aerial targets. Navy says its WV-2 is far at sea primarily to protect U. S. surface fleets from surprise enemy attack, either aerial or surface.

Such aerial radar stations would be valuable in any new over-the-horizon movement over long distances of smaller fighter aircraft.

•**Vital Tools**—Limited production order gives many of the above as the specification company, but Air Force agency to test the new weapon is its



EXPERIMENTAL SUPER CONNIE, used by Lockheed to test radio-jetlet installation, has weighty tail loads



REAR VIEW of RC-119C's top and bottom sections.



REAR VIEW of Lockheed test ship shows engines near

or declare strike is authorized by the decision to convert some of the Super Connie's transport USAF had on order to the radio version.

"Aircraft radio needs plans and control information along are a vital new defense tool," says Earl L. Bibb, Lockheed's engineering vice president. "These radio sets are increased by their mobility, their ability to be where needed on a uniquely short time."

► **10-Man Crew**—The RC-119C can carry a crew of more than 10, including pilots, navigators, flight engineers, radio controllers, radar, radio and TV operators, electronic countermeasures officers, and maintenance specialists to make real-time copies of the electronic electronic gear.

The aircraft contains a complete electronics maintenance shop, as well as a galley and bunks for its large crew.

Some indication of the height at which the pocket planes may patrol comes from the fact that cabot will be prevented to maintain 10,000 ft combat at 25,000 ft.

Despite outside temperatures as low as 60 below zero, the interior can be held at an even 75-deg., a suitable heat in winter operation across U. S. northern defense lines.

Range of the aircraft's radio units is classified.

## German Calls U. S. Aircraft 'Overbred'

Development cuts on North American F-86 Sabers get some "about the same more than necessary," as the opinion of Prof. Kurt Tank, former technical director of the German Focke-Wulf firm who has worked for the American government since World War II.

Tank did not indicate the source of his information on Sabre development, although details and cuts were widely publicized when J. H. Kneibler, NAA president, testified before a congressional committee two years ago (Aviation Week Aug. 27, 1956, p. 25).

While visiting Bremen, Germany, subsidiaries recently, the professor called the American aircraft industry "overbred." He accused the financial sector, time and labor required to develop a new airplane as constant, a report of the Transportation, Communications and Utilities Div. of Commerce Department.

"Even minor construction problems are assigned to a large staff of technicians and, for the first, a large organization is put into operation," Tank said. "This results in a complicated and expensive project."

His broadest comparison is experience in developing Argentina's P-50, Latin America's first supersonic jet fighter that flew in June 1950. The plane is slightly smaller than the Sabre. The P-50 crashed during tests.

The professor said that aircraft production should begin in Germany within three to five years. This new industry will have a great advantage, he predicted, in meeting the needs of the American, English and French militaries.

technical bulletin by **EEMCO**

**UNIVERSAL  
POWER PACKAGE  
HAS MANY  
APPLICATIONS**

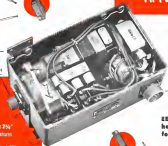


Mounting Bracket

Power Take-off

## TECHNICAL DATA

Weight complete—3½ lbs.  
Dimensions—7½" x 4½" x 2½"  
Operates in ambient temperatures up to 250° F.  
Complies to AN-M-66 and latest MIL specs.



AN Receptacle

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for the future**

**Completely self-contained** . . . This rotary air starter package, designed and built by EEMCO, contains the following elements: In an integral metal container: Motor . . . radio noise filter . . . magnetic clutch and brake . . . main gear reduction driving power take-off for operating aircraft and winch motor film take-off. Auxiliary power operating adjustable limit switches to control brakes, light switches and position indicator.

**Versatile** . . . A few of the many possible power unit and screw jack combinations are illustrated. It can also serve to drive rotary or linear type actuators through a flexible shaft in difficult installations where space and load permit complete linear operation at low speeds.

**Versatile power and speed** . . . Changes in motor winding, limitation shaft length and gear ratios permit a wide variation in power and speed without modification of the package. Versatility in positioning and indexing are possible by change of gear ratios in auxiliary gear box.

Mounting bracket and AN receptacle can be located in various positions on the container to provide additional flexibility.



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H. J. SEXTON  
PRESIDENT

**INTERCONTINENTAL**  
MANUFACTURING COMPANY, INC.  
GARLAND, TEXAS

## Air Associates Stock Sales Total 15,500

Aircraft stock transactions and holdings reported to Securities & Exchange Commission during June were listed in Air Associates, Inc., which reported the purchase of 15,500 common shares following were reported:

**Air Associates, Inc.** - J. C. Susskind, major director bought 1,000 100 common shares, making a total holding of 10,000 common shares. Intercontinental owner purchased 1,100 common shares, making a total holding of 17,100 common shares. Susskind bought 1,000 common shares. His total holding: 11,100 shares. Susskind and his wife bought 1,100 common shares. His total holding: 12,200 shares. Intercontinental owner bought 1,100 shares of 100 common shares, making a total holding of 13,300 shares.

**American Airline, Inc.** - J. H. Smith, Jr. bought 100 common shares, making a total holding of 1,100 shares. Smith bought 1,100 shares, making a total holding of 1,100 shares. Smith bought 1,100 shares, making a total holding of 1,100 shares.

**American Airlines, Inc.** - J. H. Smith, Jr. bought 100 common shares, making a total holding of 1,100 shares.

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FOR

NORTH AMERICAN'S F-86D

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A nine-ton buffer hurtling through  
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and slow smoother flight over the plane's steep  
range. Lear Vertical Gyro Indicator System instantly and  
correctly present a true picture of the plane's attitude.

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Components are making flight smoother,  
faster, more economical  
—and safer.



### LEAR DAMPING CONTROL SYSTEM

...integrates and maintains use of  
direction from individual handling  
and applies corrective force to control  
system through Lear Damping Control



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LEAR INCORPORATED, GRAND RAPIDS 5, MICHIGAN

## New Air Bills

Two bills introduced the end of con-  
gressional involvement would transfer  
operation of Washington National Air-  
port from the Administrator of Civil  
Aeronautics to the Administrator of Civil  
Aeronautics, except operation in the  
transportation of passengers, full well  
operational communication from regula-  
tion by Civil Aeronautics Board.



**DOUGLAS AD-5**

Skyraider differs externally from previous models mainly in new cockpit layout and slightly larger tail. Note four 20-mm cannons protruding from wings and under fuselage, bombs or napalm tanks.

## AD-5 Converts from Bomber to Transport

**Navy takes delivery this month on multiplex Skyraider produced on assembly lines patterned after Detroit.**

By Wilkins J. Goughlin

El Segundo, Calif.—U. S. Navy is taking delivery this month on an aircraft which can load everything from missiles to atomic bombs. It is the AD-5, a new version of the familiar "Able Dog" of the Korean war, the Douglas Skyraider.

In Korea, the AD was known as an all-purpose aircraft, capable of frequent punishment on the "Colinus Line" on one mission and, on the next landing, new engines on the Yale River under the noses of Korean-built MIG-15s. The AD-5 adds greater range and a few more uses to what already was a very useful airplane, and it adds them in a compact manner.

► **Multi-Purpose Plane**—When Navy takes delivery of its basic AD-5s, it also will begin taking delivery of a number of conversions late built by Douglas. With these newly packaged kits, the AD-5 should convert into, or be converted in a few hours from a day attack aircraft to a plain VIP transport, a cargo aircraft, an ambulance plane in one of several other versions.

This so-called "multiplex" aircraft embodies what Ed Hennessey, chief engineer of the Douglas-El Segundo Division, likes to call the "Detroit philosophy." Like an automobile, the AD-5 starts down the assembly line as a common chassis. It adds out the first out of three strategies.

- **AD-5**—This is the basic day attack aircraft.
- **AD-SN**—Night attack version.
- **AD-SW**—Adverse early warning and early strike aircraft.

The last three can be used to convert these ADs for almost any combat or support. This can be done at squadron levels or 2 to 15. The common chassis also makes it possible for the Navy to convert its AD-5s to AD-SN or AD-SW, if needed.

The AD-5 Skyraider does not necessarily dispense the ancient mechanical means that an airplane needs to do all jobs done some of them well.

"We do not advocate doing this to all models," says Hennessey, but in this case, in fact, a conversion has been found which provides a wider as military machine for an all purpose.

aircraft. It is a tribute to Hennessey and his associates at Douglas that the Navy still is ordering the propeller driven ADs along with its more advanced jet aircraft.

► **Saved by Korea**—The Skyraider was saved from oblivion by the Korean War. Designed during the closing days of World War II, it never saw action in that conflict. With the Navy converting to jet aircraft, half of the ADs was to have been delivered in 1959. But when fighting broke out in the Far East, the AD proved a new lease on life.

The Skyraider demonstrated in Korea that under certain conditions there still are jobs for propeller-driven aircraft in warfare. No jet could orbit as station during close support missions for the length of time an AD could. No jet could land the AD's large and varied bomb load.

ADs were flying in Korea with loads of more than 9,000 pounds. Douglas now has a production contract which will keep the ADs rolling off the assembly line for another two years. The AD-5 is an approved version of earlier AD models. The AD-5 is a different airplane.

► **Conversion**—Behind the propeller Wright R-1130-25W engine, the cockpit

has been widened to make the AD-5 a two-place aircraft, with side-by-side seating. Range with a full weapons load has been doubled, although crew figures cannot be revealed. It also is a safe guess that the AD-5 has the more capabilities of the old AD-4B.

Yet perhaps the most unusual thing about the AD-5 is the provision for switching its capabilities in use of the kits.

Kits presently are designed only for the day attack version, but structure of the other types also has provision for them. The kits are used to modify the large compartment behind the cockpit for various assignments. These are:

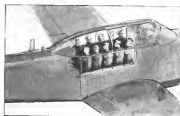
- **VIP kit**. Four backward-facing plush seats, designed to stand in the floor of the compartment for quick egress.
- **High-density passenger kit**. Two bench-type seats flanking on each side of the compartment, seating 11 men in addition to the two in the cockpit, thus converting the aircraft to a 13-place transport for smooth travel, Navy-style.
- **Cargo kit**. With plywood flooring up to a ton of cargo can be carried. A hoist is included.
- **Ambulance kit**. This includes four litters and a hoist.
- **Long-range kit**. Two 150-gal fuel tanks can be installed. This doubles the AD-5's normal payload. In addition, up to 500-gal can be carried on any of the three primary wing stations.
- **Low target kit**. This includes a belly pod for the target.
- **Photographic kit**. Two large cameras can be installed for all types of aerial reconnaissance and photo reconnaissance.

Defense Dept. officials pointed in conclusion at Navy orders for the last two types, but the others will be delivered by Douglas.

► **Advantages**—It's like being an extra surprise in an unexpected, 100 lb. pack. AD-5's "multiplex" use. A common system equipped with basic AD-5 is and a set of kits can be easily self sufficient for all missions. It can, for example, change stations without refueling in a transport squadron to help with the search, switching back to its day attack duties simply by removing the cargo and passenger kits.

To obtain these advantages, a number of changes were made when the AD-5's search different aircraft than earlier AD models. Lack of wheel down, extra weight and extra empty seats resulted in a speed decrease of from 7 to 10 mph. Despite constant drag increase, landing gear down was eliminated to save weight.

► **Atomic Crew**—Although the side-by-side cockpit somewhat compromises visibility to the right for horizon firing, overall visibility for self-defense opportunities is improved. By putting the pilot



**HIGH DENSITY** AD-5 is seen in this artist's conception seating 13 passengers on bench-type seats. Crew at two side-by-side seats.



**AMBULANCE** version of Skyraider carries four litters, in this cutaway sketch. There is a hoist with landing gear which can be used to carry wounded.



**PHOTOGRAPHIC** model can be fitted with two cameras for aerial mapping or reconnaissance. This type has been ordered by Navy.



**CARGO** carrying AD-5 is capable of flying up to a ton of freight. It also is fitted with a hoist. Physical loading is handled for these missions.



## VIP TRANSPORT

Type is shown carrying four officers in forward flying seats. Cabin can be instant quickly to stand in the plane's fuselage.

operator and the pilot together in the right and into the cockpit, it increases their ability to operate as a team.

Electronic gear in the rear cockpit area also is more easily available for daylight viewing. The radar version of the AD-5 carries more electronic gear than some large patrol boats and, in fact, much of the electronic equipment in the AD-5 was designed for patrol boats.

The day attack version is much like the AD-4 and can be converted single phase. Mounting less than 20 new engines, it also has provisions for radar.

The radar-equipped AD-5N night attack version can be used for night interception, all-weather operations and night-bombing. It has a searchlight and radar equipment for sea detection. The AD-5N can also carry out night-bombing and night-bombing work on land and has improved radar gear. The AD-5N is classified. An AD-5S version will have more night-bombing capabilities.

With addition of special gear to the

night attack version, the Navy will have a single ship capable of both searching for and attacking enemy ships, eliminating the present need for search and attack teams. Only one of this type is being turned out at the Douglas/El Segundo plant, but Navy can convert others at squadron level.

In addition to the radar-equipped version, the AD-5N has been changed. Vertical fin and rudder area has been increased by 50% in order to compensate for the fuselage being wider belly than the AD-4. The AD-5N, a typical installation looking somewhat like a small Consolidated cargo plane was necessary to obtain stability.

New bomb doors are being developed to a satisfactory extent. These, undoubtedly, can carry heavier loads.

**Internal Changes:** The two sliding canopy sections opening independently only, are not justifiable. Two large panels in the rear compartment can be

removed for emergency escape and there also is an escape hatch at the bottom of the rear compartment.

A number of internal changes resulted from the revised Douglas proposal to the assistance problem for its new model. Nick O'Connell, a Douglas aircraft technician with several years experience with the Skyraider series under operating conditions, was called in from the field to consult with El Segundo engineers on maintenance problems.

As a result, says Leonard Quick, project engineer for the AD-5, "we had one large unanticipated service problem. It's already paying off in the experimental flying." Numerous maintenance improvements have been designed into the AD-5 as a result of O'Connell's advice, changes that ordinarily would not be made in a standard line model.

**Warning:** Electrical system wiring was revised for this version. Lines in the power plant section were relocated to improve access to the oil tank and accessories. Electrical and landing gear components in the forward compartment were separated. Components were separated into packages with the new bomb manufacturer.

Much of the AD-5 structure is interchangeable with other AD models. The outer wing panels are interchangeable with those of the AD-4 or, with slight modifications, the AD-4. Electrical instruments, landing flaps, wheels, etc., wheels, landing gear and other parts are common to all of the Skyraider series.

**Other Details:** The AD-5 electrical power system is a combined AC/DC system where AD-4 had a dual DC generator with AC motor. The new model thus has a complete emergency DC power system which can operate from the generator of the battery bank. Primary flight control system is identical with that of the AD-4, although electric trim tabs replace manual tabs for queue-wing version.

The cockpit, with a larger bullet-proof windshield, has a new set of controls, despite the shift to two place seating. Instruments are arranged so that it is possible to fly the aircraft with either a one- or two-man crew in the day attack version. Crew for night and attack models is two.

New navigation instruments have been added, including a radio compass and weather beacon receiver. Landing gear is improved and a single door brake replaces the AD-4's multiple brakes.

**Specifications:**—Basic specifications are shown the same in those of the AD-4: wingspan 50 ft., length 35 ft. 9 in., height 15 ft. 7 in., doors open weight 17,000, empty of doors, 11,250, maximum speed 350 mph at 15,000 ft., takeoff weight, 27,000 lb. at 2,000 ft. or 3,500 ft. The Wright R3350 has an Army product 4 blade 15 ft. 6 in. propeller.

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Moby Dick displays soon specially built "stressed ropes," plastic envelope will be filled by expansion of gas bubble.

## Atmospheric Research Expands as . . .

# Moby Dick Balloons Explore Upper Air

If you see a "thingy" floating along through the evening sky above with fiery trails, or a glowing white sphere that can't be found on any astronomical chart, the chances are you are watching one of the huge plastic balloons making reconnaissance of 100,000 ft. altitude on a routine flight for the Air Research and Development Command's "Moby Dick" program.

**Cooperative Venture—**Moby Dick is struck at a thorough exploration of the upper atmosphere between 70,000 and 100,000 ft. altitude as a preliminary to piloted flight in this area and beyond. It is a good example of how various ARDC centers work together to implement a complete research program.

Primary responsibility for Moby Dick rests with the Geophysical Directorate at the Goddard Air Research Center at Boston. Other balloons work out of Holloman AFB, Alamogordo, N. M., with additional launching work at Air Force Flight Test Center, Edwards, Calif. and other U. S. bases.

The Moby Dick balloons range in diameter from 50 to 110 ft. with a rated capacity range to 750,000 cu ft. when fully inflated. The largest balloons are about as tall as a 20-story building when fully inflated. Even larger balloons, with 150-ft. diameter and 3 million cu ft. capacity, are under construction for high-altitude exploration. Some idea of the size of these monsters can be gathered from the fact that their cubic content is about half that of New's dirigible Akron.

The balloons are made from polyethylene plastic and inflated with helium carried on standard storage reel developed by the Navy for its lighter-than-air program. They are carry useful loads up to 500 lb. and can stay aloft for three days at altitudes ranging up to 107,000 ft. They fly at a constant altitude that can be controlled within a 2,000-ft. margin.

**Source of Season—**Moby Dick balloons launched at Holloman were loaded in the early in Norway and

North Africa. Many go as far as Bermuda and numerous air instruments carried in the balloons have been made in Mexico and Canada. About 15% of the launches have been lost in the Atlantic and Pacific oceans.

More than 100 balloons have been launched since the program began in earnestly in 1950 and more than 90% of the thingy meter reports coincide with the trace and place Moby Dick balloons in flight.

Because of their large size and the extreme altitude at which the balloons drift, it is difficult for observers not familiar with the program to identify them properly even though they are easily visible from the ground with naked eye.

The shiny, ribbed surface of the polyethylene balloons appear as an excellent reflector of light. Long after the sun has set, glancing the earth in darkness, the balloons reflect sunlight brilliantly at 50,000 to 100,000 ft. Depending on the extraneous material in the

atmosphere, this reflected light appears white, red, purple or green. Because of the difficulty of judging speed in altitude at 50,000 ft. or more, it is easy for the balloons to appear to be moving along at tremendous speeds with fiery jets of colored light passing around them, whereas they are actually moving at between 20 and 60 mph.

**False Alarms—**Once rising at the light most of the Strategic Air Command units in Texas was busy trying to catch and shoot down a thingy, saying that was actually a Moby Dick drifting along at 50,000 ft. in a place of dual total reflected sunlight. B-36 crews were baffled when they were left behind at 45,000 ft. and jet fighters drifted out trying to pursue it beyond their altitude limitations.

A balloon being over San Francisco during the peace welcoming General Flott back from Korea and those in a ballast white sphere is jet fighters rarely need to interrupt it. Another balloon "hang" over Dayton at 50,000 ft. cut off for five hours keeping the town in a turmoil of water reports.

**Lost, by Inflation—**It is also easy to mistook a Moby Dick for a planet under certain conditions.

A 4-1/2 in. need to follow some specially instrumented balloons. Place of the chase plane was when watching a Moby Dick rise into the evening sky at Holloman as a bright white sphere

against the descending sky interrupted that sight to get a cup of coffee. When they returned the balloons had drifted off but Jupiter had seen it about the same spot. They gladly watched Jupiter for an hour until they became convinced by its lack of movement.

Checking the balloons through a flash cube they noted the hole where that enormous Jupiter. The balloon was long gone.

**Economical Tool—**The balloons are proving to be an ideal research vehicle for high-altitude exploration. Because of their ability to operate at constant altitudes for as long as 36 hours they provide considerably more data than can be obtained from the relatively short flight of high-altitude sounding balloons with an Aerobus, and they also use much less expensive. A complete flight costs about \$1,500 and the balloons themselves are purchased for about \$500.

They are constructed by General Mills of Minneapolis and Wayne Research, Inc., of St. Paul. Tufts College and Washington Institute of Boston have been in developing equipment and techniques for the project.

**For Science Discovery—**One of the major discoveries contributed by the Moby Dick research has been the determination that air currents travel in current directions at varying altitudes upon. While the prevailing wind around 50,000 ft. comes from west to

east near the Equator, above 60,000 ft. the flow is southerly, around and reaches velocities of 50-60 mph at a westerly direction.

The balloons have also been used to fly various animals in exploration of the effects of secondary cosmic ray radiation. Frogs, fish, hamsters, mice and monkeys have stayed at 40,000 ft. for as long as 24 hours and have been recovered alive.

Among the other data being gathered are measurements of the composition of the atmosphere, variations in ozone with altitude, electrical conductivity at the stratosphere in the 70,000-60,000 ft. area on top of thunderstorms, concentrations of carbon dioxide, and the effects of ultraviolet and infrared light.

In addition to Moby Dick project work, the balloons have been used to drop rocket nose cones by parachute from high altitude to study stability problems and to drop small-scale models of aircraft designs for hypersonic data recording.

The project was started in June 1951. An experimental phase conducted by the Geophysical Research Directorate and Holloman Air Development Center included the development of instrumentation, procedures and methods of evaluation. By the middle of 1952, astronautics had been developed to current quality production. Operational work began in January 1953.

**Launching Sites—**Moby Dick is being



ON THE WAY, Moby Dick slowly rises.



INSTRUMENTS are parachuted to ground, transmitting light to altitude.





**New jet engine designs  
further reduce frontal area**

With their introduction of the first axial-flow jet engine over two years ago, Westinghouse engineers expanded their efforts to reduce aerodynamic drag to an absolute minimum. Continued designing and testing met with outstanding success on the J40 engine, first in its class with the smallest frontal area per pound of thrust... permitting the first two-jet aircraft design. The completed performance of two-jet planes in Korea has put real meaning in that record.

While the J40 was writing jet history in combat, Westinghouse had new turbo-jet engines in their test cells... new designs for a more powerful jet engine that possessed even greater latitude in plane design. Today, these designs have made possible the J40 with the smallest thrust frontal area ratio of any announced engine.

Realizing that even projecting rivet heads can have effect on the speed of jet aircraft, Westinghouse engineers know that they must respect every aerodynamic factor. That is why they have maintained leadership in the development of axial flow engines... why they have designed jet engines smaller in diameter for given power output than any other manufacturer. That is why they have acquired a wealth of jet engineering and designing knowledge that will prove invaluable to commercial airlines tomorrow. Westinghouse Electric Corporation, Avionics Gas Turbine Division, Philadelphia 13, Pennsylvania

LARSEN



Final Assembly: Shown above in the last stages of assembly is the Westinghouse J40... world's most powerful jet engine, fully qualified for production.

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**FIELD EXPEDIENT**—It required only a few minutes for this big Army H-19 Sikorsky helicopter to lift and place a prefabricated control tower into position atop an airfield-

operations building in Korea. The Sikorsky was called when a conventional crane tried and failed to do the job. Regular work of Army H-19s is transportation and supply.

## AROUND THE WORLD WITH SIKORSKY HELICOPTERS



**HIGH HAIL**—In rugged British Columbia, a 50-mile power line is being built to serve an Alcan Aluminum Company of Canada plant at Kitimat. Work on this project has been enormously speeded by S-55s. Run by Olinwood Helicopters, Ltd., which can strich almost everything needed to virtually inaccessible construction sites.



**PROBLEM SOLVER**—Operation of eight factories in eight Ohio and Pennsylvania cities presented unusual transportation problems for executives and staff members of Rockwell Manufacturing Company, Pittsburgh. Now a new Sikorsky S-55 helicopter is in operation, providing fast, practical transportation to and from the outlying plants.



**RESEARCH TEAM-RAFTS**—A new Sikorsky S-55 helicopter is the latest addition to Sperry Gyroscope Company's large flight research department at MacArthur Field, Long Island. This versatile aircraft will be used as a flying laboratory, helping Sperry engineers test and develop improved instruments and other equipment for navigation and flight control.



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FOAMING FOAM (left) is changed to allow hollowing out after curing after passing through United Aircraft Products' new De Aersing Cold Weather Cell System.

engine airplanes, according to Carroll.

The reason so much heat has been needed for turning out engine oil is that there had been no satisfactory method of separating dirt and oil from the hopper and backflow line from an additional makeup oil in the tank, Carroll says.

► **Oil Skips**—having the various methods used were bypassed or lightly going, control check valves over ports connecting bottom of the hopper to the main tank. But modified oil would not be the bottom of the hopper, without here, or both. The result was that a solid slug of foam oil would block oil entry to the powerplant when the engine was started, and a quick shutdown was necessary to avoid re-igniting the engine.

Carroll says "Since all attempts to obtain positive separation (oil diluted and additional oil) were failing, the obvious solution was to seal the bottom of the skip by... hole there, in the application of... large amounts of heat to the oil... to the oil system before attempting to engine start." Several units of this original process heating equipment at 400,000 Btu capacity per unit are required for the oil system.

► **Low Expansion**—No "brake fluid" is required with DCWC6, Carroll points out. No heavy, costly general heating

equipment is needed to start aircraft in cold weather. Considerable lapses among would occur in not having to transport such units to active bases. Other economies would be realized as elimination of maintenance of the equipment, need to operate it and the sizable amount of fuel consumed by the oil-skipping system during oil system warming.

► **Fast Starts**—With the DCWC6 installed, starting times are reduced from hours to minutes, says Carroll. Full throttle power may be applied to an engine that has been frozen in winter 65°F temperatures in less than 30 min, Carroll points out.

UAP's chief engineer quotes from his inspection with Wright Air Development Center engineers in which "full oil flow was developed at 244 to 26 min, depending on the particular system used... when the motor hopper, makeup oil, director separator valve, and approximately two feet of the engine supply line were maintained in a cold dry fuel tank between minus 65 and minus 75°F until the isolated makeup oil temperature had reached minus 65°F." In all cases, positive separation was provided. "Positive was never cold."

Moreover, the director-separator valve design includes built-in provisions that preclude engine oil circulation, Carroll says.

► **Speedy Startups**—The DCWC6 provides for positively controlled oil flow from which reduces time to reach a given percentage of throttle by as much as 100%. UAP's chief engineer claims figures, showing time at maximum throttle is reduced to a minimum.

Here is why the time is so sharply reduced: In a standard hopper system, as oil delivery takes place, the oil flow remains constant; the hopper and directed oil pouring into the main tank forces additional makeup oil into the circulating system.

This action may continue to the point where the desired 40% throttle can now be obtained, because throttle was an extended to such a point that engine heat took the fuel as fast as it is introduced into the oil. In any event, the prolonged delivery time can be harmful to the engine.

► **Safe Design**—The first DCWC6 hoppers incorporated a USAF designed, machined-skipped addition at the top of the hopper to contain the surplus, diluted oil.

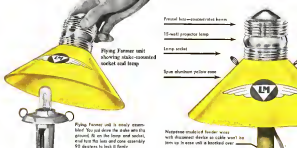
Later investigation showed that when diluted fuel is introduced into the director-separator valve, a minute amount of "backflow" through the separator port occurs which refuels the previously dry, undiluted makeup oil from entering the action during fuel dilution period.

So the need for the machined oil dilution was eliminated—makeup oil can enter the recirculatory system with the DCWC6, even when the hopper overflows.

► **How It Works**—The hopper, oil tank, fuel line and engine oil system diluted with fuel is supplied to the tank. The oil tank is located between the "in" and "out" chambers of the director-separator valve immediately upon the separator valve slightly, allowing tank oil to flow from the tank at the engine capacity at during initial warming period. Diluted valve is positioned to direct oil flow from engine to the hopper oil. Tank port is closed off.

When oil from the engine reaches 113°F, an integral Venturini thermostat moves the director valve to open the tank port so that warm oil from engine may now flow directly into the tank, less oil of the "in" tank line is de-aerated. If oil in this line is still solid, valve will release at 32° and oil will continue to flow into the hopper until the "in" tank line is closed.

All this time, oil flows from the engine line carried in line to the hopper through which the heat is used to de-aerate the undiluted tank oil. At 160°F, the director valve is moved to open the tank port wide, closed, but not completely closing the hopper port. A small flow of oil is constantly circulated through the hopper to pre-



## New! Landing Strip Lighting Only 30¢ Per Runway-Foot!

L-M's complete Flying Farmer Runway Lighting Package includes stake-mounted lighting unit, cone, lens, green threshold lights, control switch, and 10,000 feet No. 10 direct burial conductor for 2000-foot runway, only \$480!

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landing strips, runways at smaller airports, and taxiways. Accessories available include photo electric control, time switch, lighter intensity threshold lights, small runway beacons.

Get the L-M Flying Farmer Package now. Mail the coupon today for full details, giving you more information and installation instructions. (No salesman will call unless you request it.) L-M Material Company, Milwaukee 1, Wisconsin or L-M McGraw Electric Company (Chicago).

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REAL LAMBERT	44	115	142	1/2	FULL	16	12	33	DOWN HOPPER SYS.
						25	1	35.5	INVERTER SYS.
REAL LAMBERT	47	115	142	1/2	FULL	22	12	35.5	DOWN HOPPER SYS.
						32	0	35.5	INVERTER SYS.
QUINCY	17	148	187	1/2	FULL	16	7	36.0	DOWN HOPPER SYS.
						16	8	36.0	INVERTER SYS.
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CRACK shows how needed by engines to obtain percentage of oil dilution.

vent any air from entering the oil at the hopper outlet.

Locating the floatcock in the "out" chamber prevents engine oil cold temperature fluctuations from affecting the tank. This results in steady thermostat operation. Extra operation is automatic.

► **Dilution**—This is how Carroll describes dilution as performed with the DCWCS. Before engine shutdown, fuel is drawn into the diaphragm separator valve in the "in-out" chamber under pressure.

The cold fuel (even at 70°F) flows through and around the thermostat which is closed in two to five seconds. The return spring forces the diaphragm valve to close the tank port and direct the oil down through the hopper. This dilutes oil in the hopper circuit. The small opening of the separator valve allows a little oil at the bottom of the tank to be slightly diluted. When the separator valve closes after engine shut down, this diluted oil slowly rises to the top of the tank.

As the thermostat chamber back from the surrounding warm oil, after flow ceases, the diaphragm valve will tend to close away from the separator valve. That opening of the separator does not occur, as it is forced to follow the diaphragm by the force of the separator spring. Complete separator-closed check and separator valve prevents the collection of undiluted oil in any portion of the hopper circuit, Carroll says.

Since there is no communication between hopper and tank, filling both hopper and tank from a single point is accomplished by inserting a hopper filler line inside the tank filler.

### Leas Offers New Service

Leas, Inc., is offering engineering, reconfiguration and interior work, and other phases of aircraft modification, including interiors and cabin installation at Oliver Field, Santa Monica, Calif. The new service will supplement Leas's Grand Rapids, Mich. facility. Lockheed Lodestar modification will be available only at Leas Santa Monica.



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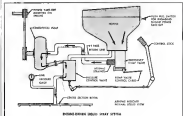
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# NEW AVIATION PRODUCTS



## Dust-Spray Kit Stresses Simplicity

Standardized equipment for ground-based planes, designed to provide more precise control and greater flexibility in spraying and dusting operations, is being produced by Transland Co., subsidiary of H. Short Reed Tool Co.

The design stresses ease of installation, interchangeability and automatic synchronization with manual flight operations the company says. This approach is exemplified in a dust-spray kit for the Stearman PT-17, many components of which can be used in other aircraft models.

The stearman hopper, mounted in front of the pilot and easily fitted to any stearman fuselage, can be used both for dusting and spraying. Attach 6-ft-long plastic with standard stearman structure. Capacity is 25 cu. ft.

For liquid sprays, the pilot can con-

rol flow through a range of from 5 to 17 gal. per min. This results the need for changing nozzle orifice type with each change in application. Inlet is driven from the hopper by a rotary pump driven by a V-belt, one mounted to a power takeoff on the aircraft's engine, and sprays out through 25 nozzles mounted at intervals along a tube or boom suspended below the wing.

Transland estimates more than 2,000 operators using some 7,000 aircraft are engaged in dusting, spraying, de-icing and sanding activities. Most of them, however, have developed since World War II, the company says.

List price of the dust-spray kit for the Stearman airplane is \$1,490 P.D.M. El Segundo.

Transland Co., 221 Chidister St., El Segundo, Calif.

## Tiny Tape Recorder Tells How Many and When.

Recorder that fits in the palm of the hand will record a wide variety of on-off phenomena together with the time they occurred, according to Adel Electronics and Inertial Recording Equipment Co. It can operate as a stopwatch.

The unit operates in subzero temperatures and over 100°C in direct sensitive tape carrying two separate data traces plus a timing trace. The tape moves under two styrene disks and by normally open or normally closed switches which make or break

the working current in the magnetized armature on or off.

Either one or both data-carrying channels can be used. Timing mark signals on the fixed channel are provided by two universal switches. Accuracy is guaranteed to be within 1 sec per hour.

The recorder can take down such information as: surface down time and operations, radio, engine and closing voltage in other conditions; head-on landings and door opening and closing. On one side where it was left as intended as a stopwatch on the other results, it provides 8 days of further information, the company says. The unit contains a switch to drive the

taking roll in the magazine and can be played into any 110-v a.c. outlet for operation.

Adel Electronics and Inertial Recording Equipment Co., Woburn, Mass.



STOWED, new unit folds against wall.



IN USE, it swings out against door.

## Swing-Out Unit Provides Seat for DC-6 Stewardess

A new swing-out folding seat for National Airlines' DC-6s and C-54s provides a chair for stewardesses during takeoff and landing.

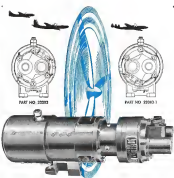
The seat assembly is mounted along side a lavatory door in the forward section.

The new seat space by swinging 150 degrees on its vertical hinges until the back is flat against the door; then it is folded down, locking in place. It weighs less than 20 lb., according to Civil Aeronautics Administration's 1790 C25.

For stowing, the seat is released by pulling a spring-loaded levered knob on the side panel of the folded-down seat. The folded seat swings into a clip mounted on the wall, providing access to both forward lavatories.

The wingman arrangement still leaves room for the standard Douglas downward seat, so that there is no down space for two.

National, Inc., Miami 48, Fla.



## ADEL PROPELLER FEATHERING PUMPS

TROUBLE-FREE PERFORMANCE

"as specified"

RATED CAPACITY: 2.75 G.P.M. @ 28 H.P. @ 6 and 170 A.M.P. @ 100 PSI

MAXIMUM PRESSURE: 475 PSI @ 100 PSI

MAXIMUM FLOW: 1400 P.S.I. max. with inlet port closed

NOTE: 13 A.M.P. @ 28 H.P. @ 6 and 170 A.M.P. @ 100 PSI

MAXIMUM TEMPERATURE RANGE: -15° to +110° F

MAXIMUM ROTATION: Counter clockwise around 1-in. pump and

WEIGHT: 28 lbs. 5-oz.

FLUID: Various aircraft oils and contaminants, such as aircraft oil

drives fluid mixed with as much as 20% water, oil, etc.

Model designed to meet requirements of Specification MIL-STD-131, Section 4.12.

NOTE: Propeller Feathering Pumps used in surplus at Military or

Commercial standards to provide safe, dependable prop feathering

performance.

AD-12, Propeller Feathering Pumps used in surplus at Military or

Commercial standards to provide safe, dependable prop feathering

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performance.



While the unit, described here, is shown in a photograph, it is not a photograph of the unit. It is a photograph of the unit, described here, in a photograph.

AD-12, Propeller Feathering Pumps used in surplus at Military or Commercial standards to provide safe, dependable prop feathering performance.



DIVISION OF GENERAL INVESTMENT CORPORATION, FORT WORTH, TEXAS

CANADIAN REPRESENTATIVE: KAY & POWER ENGINEERING, CANADIAN LIMITED

# Rarin' to Go!



## ... the new constant-speed MET-L-MATIC propeller by McCauley

- Forged aluminum alloy hub and blades
- Sealed-in pitch-changing mechanism
- Hydrolically operated
- No counterweights
- No pitch-changing parts exposed to weather
- Full-feathering if desired
- Models for 135 to 350 H.P. range\*
- CAA approved



With Met-L-Matic—big best bet for the famous Mark-Prop—your plane is up for the smoothest, quietest flight you've ever had.

**MET-L-MATIC**—the modern propeller for modern engines—the greatest advancement in light plane propeller design since the original McCauley fixed pitch Aero-L-Prop.

**MET-L-MATIC**—Forged, heat treated aluminum alloy used for both HUB and BLADES for strength with lightness.

**MET-L-MATIC**—Pitch changing mechanism completely sealed inside hub. No possibility of weather and dirt damage to key operating parts. This means long and dependable performance when you need it most.

**MET-L-MATIC**—Designed specifically for engines with flanged crankshafts and with oil available through the shaft. Use up with this efficient McCauley Met-L-Matic seal.

See the Met-L-Matic on display at National Aircraft Show Dayton, Ohio September 5 & 6 and 7.

**MET-L-MATIC** is available today only for the Continental 225 H.P. engine as reflected on the new Cessna 180. Feathering and non-feathering models on the 135 to 350 H.P. range will be available soon.

## MCCAULEY

INDUSTRIAL CORPORATION

World's largest maker of metal propellers for personal and business aircraft

1800 Maxwell Ave. • DAYTON 7, OHIO

## AIR TRANSPORT

### U.K. Revives Interest in Turboprop Liners

- British observers predict trend away from pure jets, that Comets will be last 'for a long time.'
- BOAC chairman says turbine-propeller combination is 100 mph. slower, but more economical than jets.

(McGuire's World News)

London—An epidemic of turboprop interest has hit the British aviation industry. Three major aviation manufacturers have now turboprop projects in the mail and informed industry observers are predicting that the de Havilland Comet series will be the last turboprop transport to be built in any volume here for a long time.

The revival of British interest in turboprops for civil jet transports follows a similar trend in the United States, where the turboprop is currently being banned for both military and civil transports (AVIATION WEEK Aug. 10 p. 15, Aug. 13 p. 7).

Large responsibility for the revived British interest in turboprop aviation is Sir Miles Thomas, British Overseas Airways Corp. board chairman, who has never made any secret of his preference for the turbine-driven propeller as an economical jet transport for airline operation.

Up to Sir Miles is Sir Miles' decision on a Comet II replacement that will make a less British transport more flexible. He has let some motion lines recently that he is most reluctant to permit any further turboprop transport. He tipped his hand publicly in a recent article in the London Times, where he said:

"The big propeller turbine aircraft will not be so fast in the present type by about 100 mph. It will not be so smooth. It will not fly so high. But it will be a great deal quieter than the turboprop and a good deal more economical to operate—at least 50% better than a pure jet on mileage per gallon consumed."

Present evidence is that the propeller is likely to be a good friend to aircraft for many years to come, if only because it gives faster acceleration and can be used in a bank.

Sir Miles' future interest in true turboprop aviation is linked specifically to a new project under development in Bristol Aeroplane Co., Ltd., which also makes the 300-passenger turboprop-powered Britannia transport.

**Super-Britannia**—The new Bristol project is a closely guarded company secret. Known tentatively as the Super-Britannia, it will be built around four new turbo-prop turboprops that will offer a considerable power increase over the 4,000 horsepower shaft horsepower of the Proteus models now powering the Britannia.

British turboprops have consistently fallen short of their contemporary oil-fueled power requirements. At one time, Bristol was exploring the purchase of Allison Pratt & Whitney T34 turboprops for the Super-Britannia. The commercial version of the T34 is rated at 5,000 chp and now is available for export.

The Super-Britannia probably will be a flat, straight-wing and a fuselage stretched beyond the 118 ft. of the Britannia now in production. Cruise weight will be close to 170,000 lb. more than that of a Boeing Stratocruiser. The new British aircraft would be able to clock a block time of eight hours on 3,500 lb. carrying London New York non-stop hours running as for loading and takeoff.

Using BOAC's current average consumption of 18.5 mpg. turboprop at the same dimensions to the next alternate field and a two-hour stacking allowance, the Super-Britannia would have to have a still air range of about 6,000 mi.

**Better Engines**—The engine under development for the Super-Britannia probably are an outgrowth of the Bristol oil compressor turbines turboprop design. What power Bristol is shooting

for in the new turboprops is still under wraps, but it would have to be at least more than 5,000 chp. to make the present feasible. The oil-compressor design would mean considerably lower fuel consumption than now found in recent U.S. or British turboprops.

Hamilton Standard, Accopulsors and Gerts Wright are developing high-speed propellers for turboprop operation at well over 500-mph. cruising speeds, and Bristol has a working agreement with Gerts.

In addition to the new Bristol engine development, Rolls-Royce is continuing its turboprop work with a new project aimed at higher powers than the 1,400 chp. Darts now powering the Vulcan Vickers. Rolls-Royce expanded earlier with two-stage compressors for turbo-prop and now is expected to continue this trend on its new engine.

There are indications that de Havilland also has a large turboprop in the works and British industry observers hear rumors that DH is working out prospective customers on the desirability of preventing the proposed Comet 4 with turboprops.

**Viccount Status**—The British were the first to build, fly and operate turboprop powered liners, and despite the most spectacular and dramatic performance of the turboprop, American transport manufacturers are looking their stiff competition in the foreign airline market from the turboprop-powered Vickers Viscount.

Recent criticism in the turboprop is expected to be the Rolls-Royce Conquest turbo-prop engine. Challenging the Conquest is Vickers Armstrong director designer George Edwards, who plans to enter the Conquest for the forthcoming V/G7 transport. Edwards contends the Conquest, a proven engine, claims it will give full economy of the turboprop plus the extra speed of turbojet.

He claims that a 10 per cent increase will allow clean airframe designs that stream-line and permit higher cruising altitudes. He says the Conquest is center from a turboprop.

Turboprop Doubts—In the past, Edwards' remarks have paid off. He pulled the Rolls-Royce for Viscount at a time when the Armstrong Siddeley Manx looked better on paper. Maybe now he will cure turbopropitis.

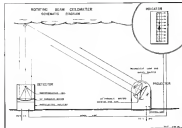
But currently the model of the Comet is alive with the status of the turboprop.

### 'Viscount Profit

Vickers turboprop Viscount remains profitable \$3,144,000 during the last 1,000 hr. of scheduled commercial service with British Overseas Airways, the carrier reports.

SEA says it plans to enter the turboprop Viscount V-700 turboprop in the London New Zealand (Lansdown) Air Race in October.





## Airports Get New Weather Gear

Cellometer gives airport traffic controller continuous reading on cloud ceiling and visibility over runway.

New York's three main airports this winter will get new weather gear to represent that they are not "airless" responses raised approaches in held or better, helping by insts at Washington National Airport.

Instruments will give the traffic controller continuous reading on two key factors governing safety in failure of landing operations that are made during low weather.

• Cloud ceiling on the approach level.  
• Visibility at the landing point on the runway.

Cellometers located at the middle meter at the approach path automatically will report to the tower whether clouds on cloud ceiling at that critical approach point. Transmitters, in which is located by the runway will report information concerning visibility at that point to the tower controller and weather office.



VISIBILITY METER and experimentally at Washington National Airport.

• **Mesa-When** this remote equipment was installed at Washington National Airport, manual approaches in visibility of less than one mile dropped from 10 to 75 in the month of last period.

Previous cellometers and transmitters equipment could not report readings automatically to a distant point and therefore had to be located at the weather office. Readings on the conventional equipment were taken a mile and more from the critical point where the weather instruments differed noticeably from the conditions that were encountered by the plane in its actual approach path.

• **ANDB Progress**-More improvements are under development and will be completed this winter, according to Benjamin C. Hyman, who is acting chief of Western Bureau's Weather Facilities and the Meteorological Commission Division.

The remote-reporting equipment is the first major improvement to come out of the research project started last winter under sponsorship of Air Navigation Development Board. Sperry Corp. scope, built the flight-test contract in the project.

Sperry, so far has completed approximately 100 new units at MacArthur Field on Long Island, N. Y.

Weather Bureau expects to make further substantial improvements in pilot's visibility readings after developing needs of these flight tests-off in progress.

## CAB Trims Denver Route Petitions to 7

Civil Aeronautics Board has taken action to spend up the competitive Denver route cut by cutting seven air line applications in the hearing from 17 to seven.

This is the second of three large delayed transcontinental and intercity route cases that CAB this spring dealt with for hearing. The two others are the New York-Chicago and the Southwest Denver case, which the Board is trying to narrow down to viable ones.

• **Flushing the Board**-The Denver case is finally deflated by CAB this month, all but one of the eight applicants are competitive with United Air Lines. UAL has a chance to add Kansas City service to its own routes, one-time with Trans World Airlines.

TWA planted the seed of this case several years ago by filing an application to add Denver to its transcontinental routes through Chicago and Kansas City to California.

When CAB sat the application down for hearing this spring, other airlines requested hearing of similar petitions. Under the so-called *Adelman Doctrine* determined by the federal courts, all similar petitions must be considered by the Board at once.

Executive Personnel Men are able to "over" 15 of the 17 applications for service through Denver, and the Board accepted his recommendations.

• **Up for Hearing**-New route requests now up for Board hearing and discussion in the Denver case.

• **TWA American, Continental and United** North American Airlines will get CAB hearing on their requests to give transcontinental service through Denver. The issue is the case is considered in order of priority.

• **Trans World Airlines** will get CAB hearing on their requests to give transcontinental service through Denver. The issue is the case is considered in order of priority.

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## CAB Ponders Subsidies Budget

Civil Aeronautics Board sets down Sept. 3 to decide its new and perhaps most complex task: publicizing subsidy appropriations for fiscal 1955. The CAB must report to the House by then (House Sept. 15).

Only two Board members were at Washington last week-Joseph Adams and Robert Dixon, Chairman Oswald Bryn and Chairman Grayman Aug. 31. And Jack Lee (representing from an operation) Sept. 2.

Consensus of the problem stems from the fact subsidy is largely beyond the Board's control in the short term, and that government's private rate from Post Office Department Airline subsidies (formerly included in rail pay) are to effect a subsidy between rail and the Board. While the Board could curb some subsidy services it necessary to cut out, that takes time because CAB is a quasi-political agency.

Normally, if the airline's route to go, the Board would pass on old routes as long as it runs down management by the airline. A non-subsidy policy requires a long period of adjustment of routes and rates to show substantial results.

• **A New Problem**-The Board's old routes with the Board, but first budgeting is a new problem. Hereafter, CAB gives the Post Office its own estimates, if they prove low, P. O. will cost for a definite appropriation.

CAB could set a definite appropriation next year, too, if things went wrong, but the Board is not planning on doing this unless business drops off.

With recently every other government agency cutting expenditures, the Board's Republican majority would be reluctant to request more money next year.

Yet the nature of airline subsidy rates makes accurate budgeting difficult. The plan of the Administration is to make a close estimate of total subsidy needed, set a modest reserve for contingencies, then make the subsidy in fiscal 1955.

At the appropriation, in one of a long series of recommendations, the Board will ask more subsidy for needy airlines. With no federal money, some airlines are expected to go well on private or proposed into in fiscal 1955.

• **Outlook**-The Board's past budget estimates have proved surprisingly accurate, the staff says. New Board members Harry Denny, who has been recovering the problem, therefore says he will Congress the Board's record on budgeting subsidies, against the new budget is this year's best estimate, and allow the appropriation request to equal for the budget.

He proposes no pooling on the budget. Outlook is there will be no

substantial degree of interannual pool.

Current airlines are on low rail rates now. Subsidized international airlines are operating on straight public utility rates.

Most airlines figure in rates set in schedule based on the total subsidy available.

Many of the local service carriers are subsidized-hence the razor-thin slide-scale type of rates, but CAB staff officially estimates that it would take a substantial increase to increase the subsidy need by 10%. Almost all domestic transplants, which do most of the airline business, are off subsidy already.

## Airline Chiefs Protest Nonsked Program

Following the lead of the Air Transport Union, presidents of truck airlines are protesting the Senate Small Business Committee's recommendations passed a sweeping nonsked.

The committee report that mandated that airlines be permitted to fly to remote ports a month between any two points and that four or five nonskeds be permitted to fly selected remote-type service (American News Aug. 10, p. 50).

• **C. R. Smith, American Airlines** president, declared in a letter that was addressed to all of the 96 members of the Senate.

"For at least three years in a row the members of the Senate have been bombarded with proposals from certain of the 'unscheduled' air carriers."

"Whether the reason their story appears to be this. They want to engage in an investigation, which they do not want to be based by the possession of the federal regulatory law, the Civil Aeronautics Act. And they do not want to be persecuted if they violate the act."

• **W. A. Phippen, United Air Lines** president, said in a letter to Sen. Edward Thorp, Small Business Committee's chairman.

"The committee appears to combine those among the 'unregulated' who are in business only because of their deficits, which had continuing subsidizing of the law. The committee's action not only that the law should not be enforced against them but that they should be assisted to stay in business."

• **Warren Lee Pennon** Board chairman of Trans World Airlines said that the Board should make public surveys, are required to take the letter with the

street, and serve large and small traffic markets."

"But the non-scheduled airlines want the street only," he declared.

## BOAC Buys CPA Comets, Shuffles Jets

London-British Overseas Airways Corp. has purchased Canadian Pacific Airlines' remaining Comet jet line.

CPA lost its last Comet (1A) last May 2 as a crash at Karachi, India, due to the delay flight from Montreal to Karachi. CPA is the sister's acquisition by British Overseas Airways. The crash only one day later, CPA was faced with the problem of being out, perhaps from RCAF, or all out.

BOAC, which has lost two of its owned case Comet 1B, purchased the aircraft.

• **BOAC Rebuilds**-The new purchase comes on the eve of a big rebuilding of BOAC Comet service. In October, the British airline will have two of its first jets in service in South Atlantic Airways for operations on the London-Johannesburg route. Two BOAC Comets will continue to operate this route, in addition to the SAA service.

The new route to Singapore, which will have increased its service to Singapore from once to twice weekly. Two aircraft will be assigned to this service plus crew training details.

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• **Phlippen Post**-The decision last week of the U.K. Ministry of Civil Aviation to accept the balanced approach with the Philippine figures in the subsidy. Until the Cabinet case along, BOAC didn't operate a regular passenger service to Manila.

The airline did not have passenger rights there, and the Philippine authorities have suggested them for the Comet.

The Philippine has their refund on grounds the British didn't in Philippine Air Lines' discharge and take on London services. BOAC's London-Frankfurt service from PA's once-weekly service from Manila to London.

Without operation rights at least in Manila, there would seem to be no possible route for the Comet between the closest usable island airport, Bangkok, and Tokyo.

## CAB Proposes New Evacuation Rules

Revised requirements for airline crash evacuation on land or sea as proposed by Civil Aeronautics Board. Deadline set by the Board for proposed industry comment is Sept. 9.

- **Highlights of the proposed outline:**
- **Escape.** Most-door exits must have a chute or equivalent device capable of landing, once on land or in the water, on one side of a landing gear. Other exits must have some kind of ladder, rope or other escape device readily available.
- **Exit marking.** Exits must be "marked conspicuously" with adequate "strong sunlight from a distance equal to the width of the cabin." Exit-opening handle instructions must be available from a distance of 30 ft.
- **Exit lighting.** Lighting system with independent power source must work on every exit. It must have an backup power to light automatically in a crash.

- **Overseas.** Extended over water flights shall have:
  - **Life rafts.** One for each person.
  - **Life rafts.** One more than necessary to hold all aboard.
  - **Procedures.** "Suitable protective seating devices."
- **Global.** Civil Aeronautics rule requiring device that is water resistant and float.
- **Speedy access.** All the emergency equipment, including rafts, must be "readily available and easily accessible in the event of a disabling, without appreciable time for preparatory protection."
- **Passenger briefing.** Passengers must be "adequately briefed" on plane and use of emergency devices. This must include a demonstration of life raft "boarding and exiting."

## CAA Installs Traffic Radar at 25 Fields

First of Civil Aeronautics Admin's automatic surveillance radar, the ASR-1 built by General Electric, has been commissioned at Norfolk (Va.) Municipal Airport. The new ASR-1 will allow ground radar operators to view all aircraft within a 50-mile radius of the airport.

The new ASR-1, now being installed at about 25 other airports, will be used by ground radar operators to view all aircraft within a 50-mile radius of the airport. The new ASR-1, now being installed at about 25 other airports, will be used by ground radar operators to view all aircraft within a 50-mile radius of the airport.

The full radar also incorporates weather target information (MTI) that, at the option of the operator, eliminates radar returns from stationary targets such as buildings and mountains, showing only moving aircraft on the radar scope.

General Electric says ASR-1 radars have been installed and accepted in CAA in the following cities and are now awaiting commissioning: Newark, Philadelphia, Detroit, Boston, Birmingham, Jacksonville, San Francisco, Bermuda, New Orleans, Pittsburgh, Oakland, Memphis, Portland, Kansas City and Dallas.

They are slated for installation at Cincinnati, Colorado Springs, Minneapolis, Salt Lake City, St. Louis, MA, Denver, Anchorage, Alaska and Honolulu, Hawaii.

## Modified Lodestar Cruises at 301 Mph.

A specially modified Lockheed Lodestar cruised at 301 mph, one airplane during speed tests on the West Coast. William J. Lee, executive director of the aircraft, reported

The performance was achieved at 75.5% rated Moto International engine thrust. The aircraft was tested at 270 mph.

The aircraft had been developed according to specifications developed by the (Naval) West Coast, a 301, which says it is a comprehensive flight modification to increase the plane's speed over more than 200 mph. The aircraft had been developed according to specifications developed by the (Naval) West Coast, a 301, which says it is a comprehensive flight modification to increase the plane's speed over more than 200 mph. The aircraft had been developed according to specifications developed by the (Naval) West Coast, a 301, which says it is a comprehensive flight modification to increase the plane's speed over more than 200 mph.

## CAB to Hear ATC Regulations

Airline proposed revision of federal aviation regulations for domestic rules will have to go through formal hearings at Civil Aeronautics Board before a change can be made.

The Board decided to hold an emergency of the Air Traffic Control Regulations.

• **Altering discounts on airfare.** The Board decided to hold an emergency of the Air Traffic Control Regulations.

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## PAA Relinquishes Venezuelan Holdings

(McGraw-Hill World News)

Genaro, Venezuela-Pan American World Airways and the Venezuelan government have agreed an agreement authorizing authorization of all PAA facilities in the country except those owned by the airline for radio communications and weather service. Pan American is being relinquished for all holdings but the figure has not been disclosed.

The agreement will take effect on the day the proposed Venezuelan-U.S. bilateral trade agreement is activated. Under an agreement of Aug. 26, 1942, Pan American's property was to be turned over to the government in 1960.

The bilateral air measure would permit Lines Aeropostal Venezolana, the government-owned airline, to operate New York-New Orleans and Miami.

## CAB ORDERS

(Aug. 13)

### GRANTED

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### CONSIDERED

Newly awarded economic regulation that includes scheduled light-air service as routes between selected airports or to airports within state limits of those served by the same carrier by certified freight carriers. Non-scheduled freight operations may not serve a scheduled carrier route at all. Air is to maintain service to avoid cost operation.

### REVIEWED

Later action operating authority for existing CAB order requiring that the CAB not operate only in land in New York. Order requires 10% control.

### DEFERRED

Delta Air Lines election to Board of the West Coast. Delta Air Lines election to Board of the West Coast. Delta Air Lines election to Board of the West Coast. Delta Air Lines election to Board of the West Coast.

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**AN 630H-1 1500 PSI**

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LOS ANGELES INTERNATIONAL AIRPORT  
LOS ANGELES 45, CALIFORNIA  
31  
CLOSING IN ONE  
NORTH AMERICAN HAS ONLY TWO EMPLOYERS  
THAT ARE OPEN CONTACT IN THE WORLD

Duke-GAS again provides personnel of its production companies, Duke and GAS, an staff.

### DENVER

Aero Transair Corp.'s decision to discontinue CAB endorsement also comprises against the carrier.  
Eastern Air Lines studies to discontinue the Denver investigation of service to Omaha, Ky. Board suggests to substitute Omaha Air Lines for EAL, says.

European Qualifications for Airlines in request to instruct in Systems Airways' Latin American flight school.  
Middle Atlantic Airlines for possible drop in the Latin American flight school.

Flight instructor requests to delay a CAB investigation this year aimed at reviewing or amending dangerous operations (Part 25 of the regulations). The board has made Safety Agency a part of the investigation.

Southwest Airways request to serve Midland-Tulsa, Tex. The CAB withdrew West Coast Airlines Southwest when it considered.

Consolidation in Lake Central Airlines. Consolidation was requested by Transair Air Group, Coast Air Lines and North Central Airlines.

Karlson's motion to investigate all reaching on route suggests shorter than 900 mi. Board and its investigation of Eastern and American Airlines' Eastern New York-Washington line on coach service (including up to 750 miles) "tends to interfere with subsequent service of commercial airlines."

### TECHNICAL NEWS



### PERMADIZING A New Concept of Rubber-to-Metal Bonding

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tion is adapting overhead coach from...  
Karlson's request to give scheduled air-traffic control to 18 military bases. Eastern Airlines, and the Board denied Karlson's application because Defense Department said that "while the proposed service would be beneficial... there could be no... go."

### SUSPENDED

Operating rights of suspended World Wide Airlines for not filing proper requests for clearance 1952 and last quarter of 1953 have suspended rights of suspension after Aug. 15 held at which airports are closed.

### CRUISE AND DREARY

Caribbean American Lines agreed to stop carrying passengers reduced by non-confirmed requests and flying on advertising scheduled flights across.

Philippine Air Lines plan to buy "substantiated stock interest" in Avianca y Compañia, Spanish Airlines... This is PAL's "last" acquisition of part of another line, the company reports... PAL has switched from DC-6 to Cessna 340 on Manila Hong Kong run.

Palmer Air Lines is increasing flight mileage 20%.

### SHORTLINES

Air Transport Canada, operates a bill to increase passport application fee from \$1 to \$5, saving total passport cost from \$10 to \$12. Fee should be out, not raised, ATA says.

Allegany Airlines carried 24,052 passengers last month, a 24% gain over July 1952.

British Overseas Airways Corp.'s July passenger traffic gained 17% from year ago to 25,158. Company issued 16-month forecasts for heavy loadings of exports returning to the U.S. this month.

Capital Airlines will get the last five Consolidations of a pump ordered from KLM Royal Dutch Airlines by year's end.

Compania Cubana de Aviaciones has the first of four Consolidations ordered in Havana-Madrid service, also going Havana-Mexico City, Havana-New York and Miami-Vancouver (Cuba beach to night) flights.

International Air Transport Assn. has switched notice administration of rates and fees to a new traffic advisory committee, replacing the traffic committee... IATA reports (see sidebar) change at \$22,796,000 compared with \$16,125,000 year ago.

Bag Airways has ordered three turbo-prop Vickers Viscounts.

Japan Air Lines plan to start two new routes in November—Tokyo-DC-6B flights a week to San Francisco and two DC-4 flights weekly to Oki-jima.

KLM Royal Dutch Airlines started trans-Atlantic DC-6A 4-engine flights Aug. 1, with twice-a-week service.

Quikair Airport movements during the first half this year indicate 10% increase for 1953 from last year's 187,119 flights.

The American World Airways now DC-6B aircraft service from New York to Boston Area stops at San Juan, Port of Spain, Belize, Rio de Janeiro, San Paulo, Porto Alegre and Montevideo.

Philippine Air Lines plan to buy "substantiated stock interest" in Avianca y Compañia, Spanish Airlines... This is PAL's "last" acquisition of part of another line, the company reports... PAL has switched from DC-6 to Cessna 340 on Manila Hong Kong run.

Palmer Air Lines is increasing flight mileage 20%.

Southwestern Airlines System reports looking 14% (14,881 passengers) of total North Atlantic air traffic in June. SAS was down, following Pan American and TWA.

South Pacific Airlines plan to use DC-4s or DC-6s instead of Select Flying Jet in previously planned flight for Honolulu-Honolulu service of night to Tahiti because of CAB limit on Select payload for that run.

Southeastern Airlines reports requests last month climbed 21% above year ago to 742,589 average miles.

Tam World Airlines now offers air-travel information to all who write the New York general sales office, which says to TWA sales office nearest reader.

TWA coach service topped a 12-month passenger-mile during the 12 months ended July 15. Total seasonal average was 51% more, domestic 58%. The service started coasting (2 hrs) Las Vegas-San Francisco service Aug. 14, but the line to \$21.39 one way.

United Air Lines traffic gained 11% last month from year ago to 265,510,000 passenger-miles... Company doubles its Henna coach service Sept. 8 to eight a week at rates 25% less than standard. Sales of package tours to Hawaii gained 46% the first half of this year.

Washington National Airport plane movements in fiscal 1953 gained 1% to 186,015, number of passengers handled increased 6% from fiscal 1952 to 2,657,295.

## SEARCHLIGHT SECTION

(Employer Advertised)

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<p><b>COMPULSION</b></p> <p>At 11 a.m. tomorrow in room 10, 1000 Main Street, New York City, N.Y. Any person who is interested in the following information should call 1000 Main Street in New York City.</p> <p>Any person who is interested in the following information should call 1000 Main Street in New York City.</p>	<p><b>BATES</b></p> <p>Any person who is interested in the following information should call 1000 Main Street in New York City.</p> <p>Any person who is interested in the following information should call 1000 Main Street in New York City.</p>	<p><b>SHAW-WALKER</b></p> <p>Any person who is interested in the following information should call 1000 Main Street in New York City.</p> <p>Any person who is interested in the following information should call 1000 Main Street in New York City.</p>

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## Mr. Hensley Closes an Era; More of the Same?

Harvest Hensley is finally leaving his post as director of the Veterans Office of Aviation Safety in the Civil Aeronautics Administration in Washington.

The cohort, William Davis, deputy director, was transferred months ago.

Some 60 days ago this writer learned that Mr. Hensley was to be granted his request for a transfer to a minor CAA position in the Imperial close of Hawaii and that he was to be replaced by Al Koch, another Old Guardman CAA official—now only about two years from retirement—who most recently has headed the International Division.

An *Aviation Week* editor immediately requested verification of this report from Administrator Fred Lee. Mr. Lee, taken by surprise, said nothing like this had been decided and apparently postponed the shift so that he could make his own announcement.

As one CAA official was telling his fellow workers in Washington, "We'll show the editor of *Aviation Week* that he's not turning CAA." The logic of this strategy as of the moment, especially considering how accurate our earlier report has turned out.

So this magazine officially closes an editorial campaign that was launched a little over a year ago, demanding the removal of both men, and their replacement by capable leaders who would clean up CAA and administer safety regulations efficiently.

The former co-conspirators are gone but another Old Guardman is in their place, and we can hardly be blamed for wondering whether we are all not in for more of the same.

It is doubtful if any business response ever came on such an intensive editorial campaign on any subject as the year-long series on CAA.

Unfortunately, none of the most supportive and telling information about the inefficient CAA could not be printed. Credibility of other material which we did print was attacked by the two directors and their henchmen because we refused to name those directly involved in many of the acts of omission and commission.

A number of conscientious employees and officials told us in detail about the mechanism of the politicking CAA big shots and their superintendents, and we were able to double-check these reports with other employees, in interviews often from coast to coast.

But when publication of any incident would point directly to one or two hapless individuals, we always held up the story and refused to publish it. The willingness of many CAA employees to write us, call us, write us, and visit us in Washington and New York was a strong testimony to the integrity of decent, honorable civil servants in CAA who had once been proud of working for CAA and had hopes of restoring their important branch of this agency to respectability. Some of them worked in the offices of the director and deputy director themselves.

The notorious "compensation" of QAS, engineered in Mission Hensley and Davis, went so far down in one of the blackest moments in civil service history. In order to put their cronies into top jobs—most of them mediocre and inept—Hensley and Davis lapped on capable men, with records of public service in aviation safety, banished them to magnificent posts, or left their salaries, as enhanced their careers by one means or another.

All of the tricks in the civil service book, and others not even mentioned by civil service regulations, were used. The famous story of the trimmed up "insurance bonus" and their phony grades, and the completed examination papers which never were permitted to see the light of day again will be remembered with disgust by decent people in CAA for a long time. The details were all published here.

We have been asked why *Aviation Week* never turned the glare of publicity on other CAA divisions, especially Airports, under Philip M. Moore, Ensign, the Director, and Al Koch's International Division, score on merit. But the meager quantity of material we received in CAA dictated a concentration of effort on the Office that would the greatest influence on air safety—or lack of it—in all classes of aircraft, from the public-passenger glider to executive and commercial transport.

Despite the weaknesses noted by Hensley and Davis—that we were publicizing only complaints from disgruntled employees—we have since learned that as a consequence high percentage of the material was accurate. None knew this better than those within CAA.

Mr. Koch's past record gives us little evidence for expecting any outstanding reforms in CAA, although we shall be happy to be proven wrong.

We do believe the present Civil Aeronautics Administrator, Fred B. Lee, is well equipped with the experience necessary to start the big cleanup job that CAA needs. It's a bigger job than most directors realize.

Whether Mr. Lee has the moral fortitude, the resistance to pressure, the superhuman energy to raise his agency's efficiency and see that it means the public's demand for honest and effective service will be held in only by time.

Certainly, he seems to have one aid not enjoyed by any other Administrator in recent years—the support of a vigorous and intelligent Undersecretary of Commerce, Robert B. Marmy, Jr., who has a refreshing and realistic viewpoint on the subject of public service.

We shall be watching CAA with keen interest, and we have already begun to see the results of our inquiries into the one administration, as published in our news columns.

Meanwhile, let us breathe. The Hensley-Davis era, at least, is closed.

—Robert H. Wood

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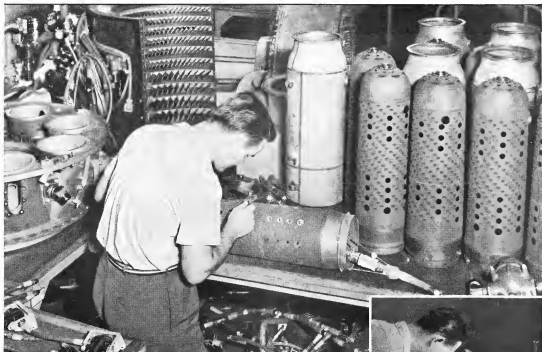
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1/8227522786606030210774845912786748746633636770364557663141888 ft. or 1/16455045573212060421549691825573497493267273540729115326283776 ft. or 1/32910091146424120843099383651146994986534547081458230652567552 ft. or 1/65820182292848241686198767302293989973069094162916461305135104 ft. or 1/131640364585696483372397534604587979946138188325832922610270208 ft. or 1/263280729171392966744795069209175959892276376651665845220540416 ft. or 1/526561458342785933489590138418351919784552753303331690441080832 ft. or 1/1053122916685771866979180276836703839569105506606663380882161664 ft. or 1/2106245833371543733958360553673407679138211013213326761764323328 ft. or 1/4212491666743087467916721107346815358276422026426653523528646656 ft. or 1/842498333348617493583344221469363071655284405285330704705729312 ft. or 1/1684996666897234987166688442938726143310568810570661407011458624 ft. or 1/3369993333794469974333376885877452286621137621141322814022917248 ft. or 1/6739986667588939948666753771754904573242275242282645628045834736 ft. or 1/13479973335177879897333507543509809146484550484565291256091669472 ft. or 1/26959946670355759794667015087019618292969100969130582512183338944 ft. or 1/53919893340711519589334030174039236585938201938261165024366677888 ft. or 1/107839786681423039178668060348078473171876403876522330048733355776 ft. or 1/215679573362846078357336120696156946343752807753044660097466711552 ft. or 1/431359146725692156714672241392313892687505615506089320194933423104 ft. or 1/862718293451384313429344482784627785375011231012178640389866846208 ft. or 1/1725436586902768626858688965569255570750022462024357280779733692416 ft. or 1/3450873173805537253717377931138511141500044924048714561559467384832 ft. or 1/6901746347611074507434755862277022283000089848097429123118934769664 ft. or 1/13803492695222149014869511724554044566000179696194858246237869539328 ft. or 1/27606985390444298029739023449108089132000359392389716492475739078656 ft. or 1/55213970





Inspector uses sealed beam spotlight and magnifying glass for visual check of inner combustion chamber.

## The sky's the limit on our tests

In the never-ending search for higher standards of jet performance, for improved materials and increased endurance, Allison engineers keep putting jets through their paces under every conceivable flight condition—even to altitudes above 45,000 feet.\*

Then, as the picture above shows, they completely disassemble the engine for a detailed inspection of every part. The parts you see here are from an experimental

model of a J35 engine that recently completed an altitude test well above the 45,000-foot mark. Some 3,500 parts are spread out on tables for examination. Tests go far beyond mere visual scrutiny and usually include fluorescent-penetrant, magnetic-particle and dye-penetrant inspections, as well as X-rays in some instances. No part is too small to be checked. And constant improvements are being made in our inspection

procedures to be sure that no flaws or breakdowns in any piece escape detection.

Yes, the sky's the limit on our tests. And this thoroughness of inspection—in both experimental development and production engines—pays off in the greater dependability for which Allison engines are famous.

\*Security restrictions do not permit identification of the actual altitude reached.



Turbine blade serrations are inspected under 45-power binoculars.



*Allison*

DIVISION OF GENERAL MOTORS, INDIANAPOLIS, INDIANA



World's most experienced designer and builder of aircraft turbine engines—J35 and J71 Axial, J33 Centrifugal Turbo-Jet Engines, T38 and T40 Turbo-Prop Engines